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DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D.C. 20523

CAPITAL ASSISTANCE PAPER

Proposal and Recommendations
For the Review of the
Development Loan Committee

BRAZIL - Minas Gerais Highway Department

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AID-DLC/P-311

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DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D.C. 20523

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AID-DLC/P-311
May 3, 1965

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: Brazil - Minas Gerais Highway Department

Attached for your review are the recommendations for authorization of a loan in an amount not to exceed $15,000,000 to The State Highway Department of Minas Gerais, Brazil to finance the dollar and local costs of equipment, material, and services required to augment the State's inventory of highway maintenance equipment and spare parts, including the cost of consulting engineering.

This loan proposal is scheduled for consideration by the Development Loan Staff Committee at its meeting on May 7, 1965.

Helen E. Nelson
Secretary
Development Loan Committee

Attachments:
Summary and Recommendations
Project Analysis
Annexes I-IV

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MINAS GERAIS HIGHWAY DEPARTMENT (DER/MG) May 3, 1965

TABLE OF CONTENTS

		Page No.
Summary and Recommendations		1
Section I	Place of the Loan in the Program	7
Section II	Detailed Description of the Project	8
	A. History and Background	8
	B. The Borrower	8
	C. Engineering Analysis	9
	- The Project	9
	- The Maintenance Organization of DER/MG	9
	- Engineering Plan for Execution of Project	10
	- Procurement	10
	- Technical Feasibility	11
	D. Economic Analysis	11
	- The State	11
	- Development Plans of the State	13
	- Direct Benefits	14
	- Indirect Benefits	16
	E. Financial Analysis	19
	- Increase in Borrower's contribution	21
	- Greater State Participation	25
	- Reducing the Scope of the Project	26
	- Reducing the Number of Residencies	27
Section III	Repayment Capacity	28
Section IV	Impact on U.S. Economy	29
Section V	Conditions and Covenants	30
Section VI	Implementation Plan	31
Section VII	Issues	33
Annex I	Checklist of Statutory Criteria	
Annex II	Exhibits - Engineering Data	
Annex III	Exhibits - Financial Data	
Annex IV	Draft Loan Authorization	

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SUMMARY AND RECOMMENDATIONS

Minas Gerais Highway Department - Improvement and Maintenance Program

1. Applicant - The applicant is the State Highway Department of Minas Gerais (DER/MG). The GOB will guarantee the loan.

2. Amount - Not to exceed in total value $15.0 million as follows: up to $7.5 million to cover the foreign exchange costs for purchases in the United States, up to $7.5 million for local cost financing. Additionally the USAID has already approved local currency financing in the amount of Cr$9.0 billion.

3. Total Cost - The total cost of the proposed project is $41.2 million equivalent of which the foreign exchange cost is $7.5 million, and the total cruzeiro cost is $33.7 million equivalent. The relative contributions to financing the project are shown below:

In Millions of Dollars

Source	Foreign Exchange Cost	Local Cost 1/	Total Cost	Percent
AID				
Eng Service	.4	-	.4	-
Equipment	7.1	12.3 2/	19.4	-
Total AID	7.5	12.3	19.8	48
DER/MG				
Equipment	-	21.4	21.4	52
Total Cost in US$	7.5	33.7	41.2	100%

1/ Shown in US$ @$1850 = US$1.00

2/ Of which US$7.5 million is to finance local cost equal to 26.0% of total local cost at Cr$1850 to US$1.00 and also includes Cr$9.0 billion already made available April 2, 1965 by a local currency loan.

4. The Project - The project consists of a program to increase the level of the DER/MG's maintenance capability to equal the requirements of the State's extensive road network developed over the past fifteen years. The State road network, which is composed of some 16,00 Km, is made up mostly of third and fourth class roads; therefore is adversely affected by rains and increasing traffic. The DER/MG has also embarked on a program of improvements which is designed to complement the maintenance effort represented in this project. These improvements fall outside the capacity of a highway department--without going to "force account" operations--and are therefore shown in the Department's financial reports under "construction." This project specifically will include planning a maintenance program equal to the demands of the system, training of personnel to overcome the shortage of skilled middle level staff, the acquisition of maintenance equipment, and developing the logistical capability required for continuing application of personnel and equipment to maintenance of the State's roads.

5. Purpose - The purpose of the proposed loan is to finance the purchase of equipment and services both in the U.S. and Brazil in order to transform the maintenance department into an institution organized and equipped to maintain the State highway network.

6. Background - From June to September 1964 the DER with the assistance of the consulting engineeering firm of Brown and Root Overseas, Inc. conducted a careful study of the DER's organization, operation and the State's road network. Based on the results of these studies, the subject application was prepared and submitted to AID. The application as first submitted requested 100% AID financing. As a result of negotiations during the project development stage, including intensive review, the applicant has increased its participation to 65% of the local cost. The DER/MG has already invested Cr$10.7 billion which can be attributed to the project, and will fund from State Revenues another Cr$26.7 billion during the next 12 months.

7. Interest of Other Financial Agencies - Export-Import Bank has indicated that it has no interest in this project. A.I.D. financing for this project has been coordinated with planned IBRD and IDB action in the field of highway transportation.

8. Views of Mission - The Mission recommends approval of the loan, including the proposed $7.5 million financing of 26% of the cruzeiro costs of the project.

9. Statutory Criteria - All statutory criteria of the FAA of 1961 as amended and appropriation acts applicable to Alliance for Progress loans have been met. See Annex I.

10. Issue - Dollar Local Currency Financing - Local currency financing by means of a dollar loan is recommended to the extent of $7.5 million, an amount equivalent to 16% of the total local cost of the project. Additionally, A.I.D. has already made available Cr$9.0 billion in the form of a cruzeiro loan from PL 480 proceeds. Originally it was planned that A.I.D. would provide a PL 480 loan of Cr$27 billion. However, as a result of a fall in the demand for wheat, increased domestic production, exchange subsidies increased domestic production, higher imports from Argentina, and a decline in the wheat price, PL 480 generations will be substantially lower than was projected some months ago, and the entire local currency program has had to be drastically reduced. The expected PL 480 availabilities under the current agreement are entirely committed as shown in detail in the chart below. Thus PL 480 generations offer no assurance of financing for the project. As a result, the project has been cut back by approximately Cr$4.2 billion and dollar local cost financing is recommended.

The implementation plan for the subject project indicates a purchase schedule of 12 months. Considering that no deposits from the present Fifth Wheat Agreement have been made to the Mission's account over the last six months, and in light of the fact that negotiations for a Sixth Wheat Agreement have not been initiated (normally at this time of year, the GOB and the Mission would be in deep negotiations for a wheat agreement) it is not conceivable that cruzeiros that could possibly be generated from a proposed Sixth Wheat currency financing for this project.

The Mission has already explored several alternatives to insure full funding to meet the local costs for this project. The Borrower's participation has been increased to 65% of local cost, which appears to be as a great a contribution as it can realistically be expected to make; and secondly, to the extent possible local currencies available to the Mission under the existing Fifth Wheat Agreement have been made available to the project.

As is demonstrated below the allocation of presently available 104(g) cruzeiros is in such final form and constitutes a level of financing that is equal to and possibly greater than the total amount of cruzeiros that could possibly be available to finance these already mutually agreed upon projects. As is specifically detailed in the chart below the total Cr$123.8 billion represents over 100% of the U.S. DA present estimates of total generations under the Fifth Agreement. The best guesses as to the ultimate level of local cruzeiros do not run to amount sufficient to consider financing more than the Cr$9.0 billion already made available under a local currency loan signed April 2, 1965 with the borrower.

Allocation of USAID/Brazil
104(g) Local Currencies as of April 29, 1965
(Cr$ in Billions)

	A	B	C	D	E	F	TOTAL
1. BNDE (State & Regional)	5						
2. BNDE (Private Enterprise)	23						28
3. Coperbo		2					
4. Parana Road		10					
5. Minas Gerais Highway Equipment		9					21
6. CEMIG		4					
7. Water Fund			6				10
8. Para Highway Equipment				1			
9. GOIAS Road				2			
10. Copel					4		
11. Eletrobras				17			
12. ATFLD				5			29
13. Rio-Sao Paulo Road					11.8		
14. Rio Grande Do Sul Road					14		25.8
15. BNDE (other industrial projects)						3.8	
16. BAHIA Road						3.5	
17. Coperbo						2.4	
18. Recife Drydocks						.3	10.0
TOTAL	28	25	6	25	29.8	10.0	123.8

A - Non-Obligating Loan Agreement
B - Obligated
C - Internally Signed Authorization
D - Projects mutually agreed to by GOB and USAID - Project Development Stage.
E - Programmed to Support Previously Authorized Projects
F - Allocated - under negotiation

As can be seen from the above demonstration of the Mission's most recent breakdown of 104(g) cruzeiro allocations, the possibility of any further displacement falls into two areas. In Column D "Projects mutually agreed upon by the Government of Brazil and the Mission" and Column F "Allocations already made for which agreements are being negotiated." Obviously to attempt now to convince the Government of Brazil that the high priority projects mutually committed in Columns D and and F need not be financed at the agreed levels, but at lower levels to provide

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additional local currencies for this project would indeed be contrary to the overall thrust of the present Government for planning and realistic goals. The alternatives to the financing plan proposed herein have been thoroughly considered and the conclusion to finance $7.5 million of local cost with dollars is based on (1) the complete obligation of all the cruzeiros conceivably available under the existing Fifth, (2) the untimeliness of a possible Sixth Agreement in terms of providing financing for this project and (3) the high level of the State's participation in terms of the dollars proposed for local cost financing.

Careful analysis of the State of Minas Gerais' sources and uses of funds for highway construction and maintenance shows that the State will be called upon to make as great a financial effort as is possible on the basis of the revenues to be derived from the National Highway Fund and from the matching State contribution. The possibility of an increase in the State's participation in National Highway Fund revenues was explored; however, it was concluded that this would not be feasible for legal and administrative reasons.

Execution of the project, which involves the investment of the equivalent of Cr$76.2 billion, will, of course, have indirect effects on the balance of payments. Some of these, such as the importation of equipment and special parts by Brazilian highway equipment producers, are readily apparent. In addition, there will be general pressure on imports as a result of this project. Available data are inadequate for a precise calculation of the marginal import rate; it is likely, however, that the indirect impact on the balance of payments will be in excess of 26%, which is the extent of dollar financing of local costs contemplated. Thus, dollar financing in the recommended amount is justified, and is necessary to assure successful execution of this high priority project.

To the extent that present estimates of Cruzeiro generations under the existing 5th agreement are exceeded and become available in time to be applied to this project, the $7.5 million proposed for local currency funding herein shall be reduced by the Mission and in the event Cruzeiro generation over the existing 5th or under the proposed 6th Agreement become available in sufficient time for application to the financing of this project.

11. Country Clearance - COCAP approved this project for A.I.D. financing on November 24, 1964.

12. Recommendations - Authorization of a dollar loan to the DER/MG not to exceed $15.0 million.

a) Repayment of the loan by the Borrower within twenty (20) years of the first disbursement including a grace period of three years at three and a half (3 1/2) percent per annum on the disbursed funds.

b) The two step option will be required of the GOB with repayment scheduled at forty years (40) including a ten (10) year grace period, with interest at 1% during the grace period and 2 1/2% thereafter.

c) The borrower will covenant not to incur indebtedness maturing in more than one year without AID consent.

d) The GOB will guarantee the loan prior to disbursement of AID funds.

13. Other Terms and Conditions

a) Equipment and services financed under the foreign exchange portion of the dollar loan for the project shall be procured from the United States of America.

b) The Borrower shall provide evidence satisfactory to A.I.D. that its own contribution to the project will be made available as needed; also that funds will be made available for the continuing operation of the highway maintenance department.

c) The Borrower shall employ qualified technical consultants and procurement agents, satisfactory to A.I.D., to advise and assist in carrying out this project.

d) The loan shall be subject to such other terms and conditions as A.I.D. may deem advisable.

14. Working Group

Lawrence J. Brailsford - USAID/B - CD
Benjamin G. Watkins - LA/ENG
Cecil Bower - USAID/B - HWY
David M. Trubek - USAID/B - LGA

Approved: DDOM, W. A. Ellis
DOM, S.H. Van Dyke

Drafting Officers: L. J. Brailsford
C. Bower

SECTION I - PLACE OF THE LOAN IN THE PROGRAM

2.01 - An analysis of the Brazilian economy shows both the need and the opportunity for the United States to provide substantial support to the stabilization and development programs of the present government of Brazil. The present government which began life with inflation undermining the economy and foreign exchange reserves squandered, is making a concerted effort to attack the problem of inflation, to restart the process of economic development on a sound basis, and to institute vital economic and social reforms.

2.02 - Analysis of the economic situation indicates the areas in which U.S. assistance should be concentrated. Firstly, assistance is needed in support of the government's program to fight the inflation which has had such a disastrous role in retarding economic development, contributing to recurring balance of payments deficits and distorting patterns of investment. Allied with this objective is the need to help Brazil meet its serious balance of payments difficulties. Second, the analysis shows that capital investment is needed to assist the economy of Brazil in eliminating economic bottlenecks and creating the infrastructure necessary to economic development.

2.03 - One of the sectors in which major investment can be applied to greatest economic advantage is the transportation sector. Lack of an adequate and effectively maintained road network is a principal bottleneck in the development of Brazil. More specifically, significant economic benefits can be derived from investment in road maintenance in selected areas. As this project demonstrates, Minas Gerais is one such area.

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SECTION II - DETAILED DESCRIPTION OF THE PROJECT

A. History and Background

1.01 - The proposed project is the result of a re-evaluation of highway needs in Minas Gerais starting with the appointment in May, 1964, of the present General Director.

1.02 - A wholly owned subsidiary of the U.S. Engineering firm of Brown and Root Inc., Brown and Root Ultramar Ltda, was hired to assist in the conduct of an extensive study of the DER's maintenance organization and operations. The result of that study formed the basis for the application submitted to A.I.D.

B. The Borrower

2.01 - The proposed Borrower is the State Highway Department of Minas Gerais, Departamento de Estradas de Rodagem do Estado de Minas Gerais, DER/MG.

2.02 - The DER/MG was created as an official agency of the State by Law No. 1.731 of May 4, 1946, which was subsequently amended by Law No. 1.043 of December 16, 1953, and on December 18, 1957, by Law No. 1.701.

2.03 - The DER/MG is responsible for design, construction, maintenance and operation of the State Highway System. The Department must carry out its activities in accordance with a State Highway Plan submitted to and approved by the State Governor annually.

2.04 - In accordance with Chapter V, Article 23 of State Law 1.043, the Governor may upon recommendation by the State Highway Council, of which the General Director of the DER/MG is Chairman, authorize the DER/MG to obtain loans from national and international lending institutions, or by public subscription. This loan request has been approved by the Governor in accordance with these procedures.

2.05 - The World Bank in a recent report on transportation in Brazil, which includes State Highway Departments, reported that the administrative and managerial capacity of the DER/MG is better than any other Brazilian State Highway Department including the Federal Highway Department. During intensive review this was reconfirmed to the Mission's satisfaction. The general level of excellence exists principally at the Division leadership level and above. As is indicated in the engineering analysis and the implementation plan, training of the personnel in the lower echelons is a major aspect of this project.

C. Engineering Analysis

The Project

3.01 - The project consists of increasing DER/MG's capability of maintaining the State highways. Specifically this will include planning a maintenance program equal to the demands of the system, training of personnel, the acquisition of maintenance equipment, and developing the logistical capability required for continuing application of the personnel and equipment to the program. The consulting engineering firm has already assisted the Borrower in developing a reorganization plan, and is assisting in the development of a permanent in-service training system together with the development of more rational systems for spare parts and record keeping. The completion and implementation of these programs and systems will be required as a condition precedent to disbursement for other than engineering services under the loan.

The Maintenance Organization of the DER/MG

3.02 - The organization chart included as an exhibit in Annex II shows the Divisao de Conservacao (Division of Maintenance) as a part of the overall organization. The responsibility of the State highway maintenance program rests with this division. For operational purposes the State has been divided into 30 residencies, each of which has the responsibility for the maintenance of an average of 530 kilometers of highway (maximum 884 kilometers and minimum of 344 kilometers). The maintenance of equipment is the responsibility of the Divisao de Material e Equipamento (Division of Equipment and Material. This division has responsibility for suppliers, central shops and equipment maintenance. It does not have responsibility for construction material and tests. There is a central shop equipped to make major repairs in Belo Horizonte, the State Capital, and a repair shop will be established in each residency to provide for ordinary maintenance and repair. In addition, five of the residency shops, strategically located, will be equipped similar to the central shop in Belo Horizonte and will be able to make major repairs. This is desirable because of the distance involved in a State almost as large as Texas. This organization is similar to a typical organization in a state highway department in the United States. An analysis of these two divisions indicates a basic organization capable of performing the required functions. There is a shortage of maintenance and repair equipment which will be eliminated by procurement of the items requested in this Loan. There is also a shortage of trained personnel, both equipment operators and mechanics; the Loan provides for a training program to alleviate this shortage.

Engineering Plan for Execution of the Project

3.03 - DER/MG proposes to employ a private firm of consulting engineers to advise and assist in planning the maintenance program, in training the personnel required to staff it, and in developing the logistical strength to make the program function properly. It is contemplated that the consultant would initially furnish six technicians to give instructions in the operation and repair of maintenance equipment and the use of shop tools. A training manual is already being developed (see Exhibit 2 Annex II) to insure the availability of such an aid for the training of personnel who may be added in the future. These technicians would also assist in establishing a spare parts control and warehousing system.

The course of action of developing permanent in-service training has been already begun with the assistance of the consulting engineer and will provide the basis for the continuing upgrading of the skills of both field and maintenance personnel. The Borrower has requested and received assistance in training from the major suppliers of highway maintenance equipment in Brazil. Normally these manufacturers would provide instruction as to the maintenance and operation of equipment supplied by them; however, in this instance the Borrower has requested additional training time up to three months from each of the manufacturers who normally supply equipment and material to the State Highway Department. Additionally it should be noted that these instructors are participating in the training program developed by the consulting engineering firm of Brown and Root Inc. The results of this first course will provide the basis for the establishment of a permanent in-service training program.

Procurement

3.04 - Brazilian factories produce much of the equipment and supplies needed for the project. It is therefore planned to utilize these local sources of supply whenever possible. Road equipment, spare parts, shop tools and supplies that cannot be purchased locally are to be procured from United States sources in accordance with A.I.D. regulations. Procurement in the United States will be limited to those companies which have established sales and service brances in Brazil and which will be able to supply parts and technical assistance for the equipment procured. The acquisition of equipment and supplies in Brazil will be carried out in accordance with A.I.D. and DER/MG regulations under the supervision of a representative from the consulting engineers.

Excess Property

The equipment, tools and supplies which are to be procured in the United States shall be obtained from A.I.D. stock of reconditioned excess property to the extent that Borrower's representative finds this technically suitable. The Borrower's representative will take full responsibility for the borrower to examine the availabilities of such excess property and to make the technical judgment as to their suitability for use in the project. Prior to the procurement of any new equipment, the Borrower's representative will indicate in writing to A.I.D. either that such equipment is not available from A.I.D. reconditioned excess property stocks on a timely basis, or that the equipment which may be available is not suitable for use in the project.

Technical Feasibility

3.05 - The equipment requirements are itemized and attached as an exhibit in Annex II. They were established by actual reconnaissance of the roads to be maintained and repair shops to be equipped. This was followed by mathematical determination of the total quantity of equipment needed. The equipment on hand was then inventoried and subtracted from the total requirement and minor adjustments were made; spare parts were determined as a percentage of the equipment cost. Since the original inception of the project, it has been necessary to reduce the procurement of equipment and spare parts by Cr$4.3 billion. This is being accomplished by a selective reduction of certain items on a statewide basis. The feasibility of the reduction has been verified and a revised procurement list is being prepared. The spare parts to be purchased will be selected after the basic equipment has been purchased in consultation with the manufacturer's local representative, with the concurrence of the technical consultant, and approval by USAID. Prices were obtained partly from prior contract experience and partly from catalog listings. This method is the one widely used and is generally considered as the most rational manner of determining maintenance equipment requirements. A reasonably firm estimate of the cost to the U.S. Government of providing this assistance has been prepared and approved by the Working Group. All pertinent requirements of Section 611 of FAA have therefore been satisfied.

D. Economic Analysis

1. The State

4.01 - The State of Minas Gerais is located in the eastern central portion of Brazil, between the 4th and 23rd parallels; its area is 593,401 square kilometers, it has a population, as shown by the 1960 census, of 9.8 million inhabitants (16.5 inhabitants per sq. km.). The regional economy of the State is considered to be relatively good in comparison to most of the other Brazilian states.

4.02 - Historically, the area's initial development was the result of its mineral wealth. Gold was the principal attraction that brought people from other states. Minas was the most populous state of the nation until the thirties when profits from gold mining declined and mining activities were replaced by agriculture. In spite of the fact that only 11.8% of the State's area is adaptable to agriculture, that sector now accounts for 50% of the State's income. Cattle raising also became of major importance in the State; today Minas Gerais has the largest number of cattle in Brazil (18.0 million head in 1961).

4.03 - Minas is now the second state in population and has the largest iron ore deposits in the country (40-50 billion tons) and the most accessible manganese reserves (10 million tons). It also possesses large reserves of pyrites, bauxite, rock crystal, limestone, caolin, niobium, berilium, cassiterite, and secondary deposits of other minerals.

4.04 - In industry, Minas is second in the production of steel. It has the largest number of steel mills; it is first in the production of chrome-steel, manganese-steel; the only producer of Nibel steel, and first in production of silicon-steel pipe. Production of aluminium is increasing in importance. Minas is the only Brazilian producer of arsenic, gold, and silver.

4.05 - In the field of agriculture, the State ranks in total Brazilian production as follows: second in rice (900 thousand tons); second in bananas (39.7 thousand tons); in sugar cane (5.6 million tons); second in beans (744.2 thousand tons); second in oranges (1.4 billion oranges); and it compares favorably with the leading Brazilian producer, Rio Grande do Sul, in the production of corn (1.8 million tons). The State is the largest producer of milk. The milk suppliers, for Sao Paulo and Guanabara (Rio), are located in the south and southeastern areas of Minas Gerais.[1/]

1/ These data are from Brazil Annual Statistical reports for 1962.

4.06 - In 1956, the income of the State of Minas Gerais was equivalent to 11.1% of the total Brazil income; this percentage decreased to 10.4% in 1958 and 9.78% in 1960.1/

2. Development Plans of the State

4.07 - The State Government in an attempt to speed up the rate of development has created a State Bureau, charged with formulating a plan of action to coordinate the administrative activities in the public and private investment field. Its economic Recovery Tax amounts to almost 50% of total state income, and is used exclusively on public investment, i.e., DER, FRIMISA (the State Cold Storage Plant) and CEMIG (State power company).

4.08 - A State Development Bank has also been created to finance small and medium size enterprises. Under this Bank the program of activities of the Warehousing and Silos Company, CASEMG, has been broadened. This program encourages greater agriculture production by making it possible for the farmers to adequately store their produce; however, the problem of getting the produce to market still depends on the usability of the State road network. This project, therefore, is important to the realization of the benefits of the warehousing project as well as other of the development efforts being carried out by the State.

4.09 - Some of the major industrial and mining projects in the State are USIMINAS (a steel mill in the eastern portion of the State producing 500,000 tons of steel annually; presently planning to increase its production to one million tons), the HANNA Mining Company operation in the State presently extracting 500,000 tons of iron ore annually. Normally the steel and iron ore produced by these two companies would be transported by rail, but in Minas a considerable portion is hauled by truck because the antiquated rail network has been overburdened for several years and is principally carrying iron ore to Vitoria, Espírito Santo for export. As a result of this situation the road system is more important to the development of these industries than would be the case if the railway system were capable of providing a larger share of the transportation requirements.

4.10 - The State has recognized that central to its economic growth is the usability of its extensive road network. The relative importance of the road network to the various economic sectors in the State is indicated on the over-lay maps included in Annex II. These

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1/ Fundação Getúlio Vargas, Brazilian Review of Economy, March 62.

over-lay maps show that the State road network has been developed to serve the major economic sectors. Agriculture depends almost completely on truck transport to market its produce, industry is almost equally dependent on roads in view of the low rail capability, and mining - traditionally served by rail - depends on truck transport for a considerable tonnage.

Assigning an index of 100 to the year 1953, the highway network increased as indicated below:

(Percentage Increase in System Kilometrage - 1953 Base Year)

1956	1957	1958	1960	1962	1963
132.4	147.4	147.4	141.3	165.7	167.7

Total Kilometrage in 1956 was 13,061 and 15,717 in 1963.

4.11 - The maintenance costs for highways, in constant value cruzeiros, increased in the following proportion (base 1953-100):

1956	1957	1958	1960	1962	1963
86.5	159.5	167.3	95.4	136.2	152.5

4.12 - It should also be noted that, according to the latest DNER traffic count in Minas (1963), over the same period, the automobile, truck and bus traffic on these highways increased by 299%.

The deterioration of highways is in ratio to the number of vehicles using them; i.e. the greater user intensity demands larger maintenance budgets. As is evident from the above data, the network to be maintained increased at the rate of 67.7% and traffic increased by approximately 300% during this period, and the maintenance budget in real terms increased by only 52.5%. In fact, the rate of increase of maintenance costs was not only lower than the growth rate of the network, but also below the rate of increase for vehicle traffic.

3. Direct Benefits a/

4.13 - In correcting the deficiencies in the usability of the existing road network the proposed project will result in measurable direct benefits to the State and regional economy.

(a) A High Benefit Cost Ratio

As shown by the computation and data included in Annex II the annual direct costs of the project will be US$14,031,048 per year after the grace period.

Direct benefits were computed by considering the savings that will result from a properly maintained road due to time

a/ Direct benefits shown herein are not additive; rather only selected illustrations of the economic justification of the project.

saved en route, the reduced consumption and longer life for tires and spare parts. Annex II contains the detailed computations made, following procedures accepted by AASHO (American Association of Highway Officials). The annual benefits after the grace period are equal to US$39,741,155. Therefore, the Benefit/Cost ratio is:

Benefit/Cost ratio $\frac{\text{US\$39,741,155}}{14,031,048} = 2.83$

The $39.7 million represents the dollar equivalent of the value returned to the economy in the form of savings to road users.

(b) Decrease in investment losses in rolling stock

In highway transportation, most of the rolling stock is owned by private industry and includes the purchase of vehicles and their upkeep. The Brazil-United States Joint Commission in 1953, in its General Report in regard to the economic situation of Brazil, states that "close to 1/9 of the total number of motor units within the country are permanently placed out of commission due to the poor conditions of many highways in the interior of Brazil".

Assuming that conditions have improved since that time, and that the coefficient of 1/9 has been reduced to 1/20 only 5% of the motor units are permanently put out of service each year due to the poor condition of the highway network.

Multiplying this rather conservative percentage times the total number of registered vehicles in the State, the yearly loss of investment in Minas Gerais, would be as follows:

Year	No. of Registered Vehicles	Cr$ Value of Vehicles out of Commission
1960	112,198	5,610
1961	100,465	5,023
1962	113,244	5,662
1963	126,363	6,318

Assuming $1,000 as the average value of each vehicle placed out of commission the effective loss of capital, by 1963 would be at least $6.3 million dollars. Further, in view of the apparent practice in Brazil to keep vehicles operating far beyond

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normal U.S. standards of economic repair, it is assumed that only half of this amount or $3.2 million is a more valid estimate of this saving.

(c) Losses due to paralized traffic due to rainfall

The absence of adequate highway maintenance has caused paralization of traffic on 2nd, 3rd, and 4th class roads in Minas. In Annex II, a computation is shown of the cost of time lost to the national economy, measured in relation to the value of service rendered by trucks and buses. Computations included in Annex II, show that the losses per year due to paralyzed traffic total approximately US$2.3 million, an amount which represents added cost to the industry. This cost would be substantially less if a constant dependable flow over the State's road network were possible. This loan should provide such conditions thereby making possible the savings outlined above.

(d) New employment

DER will hire an additional 2,757 employees to execute the project. These new personnel will, by-and-large be assigned to the residencies following their successful completion of the training required to upgrade their skills.

Because it is DER's practice to recruit from local communities whenever feasible and due to the training program which will upgrade skills one of the side effects of this project will be to aid in creating a middle level manpower force in Brazil. Some of the jobs to be filled by these new personnel are: mechanic helpers (60) diesel truck drivers (400) operators of special road equipment (338) etc. These are skills which will permit these former agriculture workers, (80% of all new personnel hired by the DER come from agricultural jobs), to learn trades in great demand in Brazil.

4. Indirect Benefits

4.14 - Generating effects on the National Income

(a) Excluding the US$6,760,000 equivalent already invested by the DER/MG, an investment of $34.5 million will be made. Of this investment, US$15 million equivalent represents equipment

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purchases in Brazil. Applying the multiplying factor of 2.75, the capital income generating factor for Brazil established by the Getúlio Vargas Foundation for capital input for basic infrastructure sectors, including highway equipment as of 1963, it can be assumed that the national income will be increased to approximately $41.25 in dollar equivalents. ($15 million for purchases in Brazil times the capital income generating factor of 2.75). *

(b) Generating effects on the Regional Income

4.15 - Based on information supplied by the State Bureau of Agriculture, the expected agricultural harvest for 4 of the main products in Minas Gerais during 1965 is as follows:

Corn	2.0 million tons
Rice	1.0 million tons
Beans	250.0 thousand tons
Cotton	90.0 thousand tons
Total	3,340.0 million tons

Assuming an adequately maintained highway system providing reasonable access to producing areas the theoretical produce available for export equals about 1.4 thousand tons as follows:

	Production Tons	Apparent Consumption Tons	Theoretical Excess Available for Export
Rice	1,000,000	600,000 **	400,000
Beans	250,000	260,000	-
Corn	2,000,000	1,200,000	800,000
Coffee ***			200,000
			1,400,000

4.16 - The market for this exportable surplus (except coffee) is made up of Goiás, São Paulo, Guanabara, Rio de Janeiro, and Espírito Santo. It is estimated by the State Secretary of Agriculture that 20% of all agricultural produce is left in the fields and therefore is lost income to the producer due to impassable roads during the marketing season. Using only the four main agriculture products noted above which have a production of 3,340 thousand tons, and applying the 20% factor to this selected

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* Also used in GOB's Development Plan.

** Consumption data for 1963.

*** Anticipated export tonnage. Brazilian Coffee Institute.

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tonnage we have an estimated saving of almost 800 thousand tons to be realized following the completion of this project.

Indeed, in 1954 the Klein and Saks Mission stated in their report concerning this problem in Minas Gerais, in language which is equally applicable today, "the farmers and the public in general, prefer to have dirt roads well maintained without deep ruts and usable bridges now rather than the promise of even paved highways tomorrow", and added that ..."the improvement of highways decreases a great deal of the food problem and helps the transportation of perishable foodstuffs which is unreliable at present."*

5. Institutional Development

4.17 - The major institutional aspects of this project are: (1) the establishment of a system for realistic distribution of costs so as to use to more accurately reflect the cost of specific operations and to establish (for the first time in Brazil) replacement schedules for equipment and machines: (2) The installation of a permanent in-service training course in the Highway Department will insure the continuing up grading of line skills to meet the growing needs of the states extensive road network. In this regard the Borrower has already engaged the services of training personnel from its traditional suppliers of equipment and machines. Normally these manufacturers would provide instructions as to the use and maintenance of equipment supplied by them; however, to train the large number of personnel added to the Departments staff under this project the engineering consultant has worked out a training program in which the local manufacturers are participating that requires a minimum of three months training for new personnel and up to three months training for existing personnel. Additionally, the consultanting engineering firm will provide six specialists for a two year period to assist the Borrower in developing new systems for spare parts control, operational methods and an orientation course for personnel to be added in the future. The consultanting engineer also has the responsibility for developing the training manual to be used in the in-service training course of the Highway Department. It is contemplated that with these institutional changes the DER/MG will be the model state highway department in Brazil and should serve as an example for other highway departments to follow. The training proposed herein does not include the administrative and chief level. Analysis of the DER/MG capability at this level appears to be totally adequate for the Departments needs. It should be noted that of the eight division chiefs all but two have advanced degrees from Universities in the United States or Europe; additionally two of the division chiefs have taught in American universities as full professors. The World

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* Klein and Saks report on "The Food Problem in Brazil", 1954, pg. 20-21.

Bank in its recent inspection of the transportation picture in Brazil concluded in its report that this highway department with its present personnel have the best administered and operating highway department in Brazil including the National Highway Department.

The DER/MG has already instituted a record keeping system in accordance with guidelines spelled out by the American Association of Highway Officials. This system provides for the proper distribution of cost as to use and will provide the basis for replacement of existing equipment on a timely basis. Under existing Federal and State laws the Department maintains records in conformity with a system devised in 1940. It is planned to seek modification of these laws based on the example being set by the Borrower.

Financial Analysis

5.01 - The financial plan for the project is as follows:

(Cr$ in billions) ($ in millions)	Already Invested	To be Invested CY'65	To be Invested CY'66	Total
DER/MG	Cr$10.7	Cr$20.8	Cr$5.9	Cr$37.4
AID dollar financing		US$ 5.5	US$2.0	US$ 7.5
AID cruzeiro financing	Cr$ 9.0	Cr$ 6.4 a/	Cr$7.5 a/	Cr$13.9

a/ US$7.5 for local costs @ 1850 = US$1.00

Funds already invested by the DER/MG represent expenditures made in connection with the subject loan. These expenditures were made principally for the acquisition of additional land, construction of buildings and garages at various residencies, renovation of previously existing sites, existing maintenance equipment attributed to the project, and spare parts and equipment ordered since submission of the application.

Funds to be invested by the DER/MG represent additional purchases of highway maintenance equipment and spare parts that have been identified in the project for the DER/MG's specific acquisition, selection, acquisition and training of personnel to operate the equipment, and participation in the procurement of equipment, tools, and spare parts.

In addition to their contribution to this investment project, the DER is committed to funding, in future years, the operational costs of an expanded maintenance program and the replacement and maintenance of this equipment. The heavy increase in such expenditures is shown in the table of source and application of funds on page 18.

5.02 - It is proposed that AID finance 100% of the foreign exchange costs and 36% of the local costs of the project. The $7.5 million proposed for local cost financing represents 26% of the total local cost of the project; the Cr$9.0 billion represents the maximum AID cruzeiro participation in light of the Mission's cruzeiro availabilities and other high priority projects for which cruzeiro commitments have already been made (see Exhibit 4 Annex III). AID funds, both cruzeiro and dollar will be applied exclusively to the procurement of maintenance equipment, tools, spare parts and engineering services. As outlined in Annex II, all AID funds will be obligated for purchases within one year of the signing of the loan (with the exception of those earmarked for services).

5.03 - In arriving at the cost estimates for the local purchases, the applicant has applied 55% inflation rate to the procurement schedule. While this is higher than current GOB estimates (25%) the Mission feels that it is a fair estimate of price increases over the 24 month purchase schedule anticipated in the implementation plan. In reaching this conclusion, the Mission considered the 40% increase in the Price Index as published by the "Conjuntura Econômica", February 1965, for the period September to December 1964; the Ministry of Planning's projections included in its Three Year Development Plan of 25% for CY'65 and 10% for CY'66. Thus, the total possible inflation affecting the cost of the subject equipment could reach 75%. In view of the fact that some purchases are already being made, (Cr$9.0 billion) and the others are scheduled over the 18 month life of the project the average of 55% appears to be reasonable.

5.04 - It is clear from Annex III that PL 480 funds arising from the 5th Agreement are considerably less than had been anticipated in June 1964 and it is also apparent that the demand for these cruzeiros is far in excess of the anticipated availabilities. Therefore, before recommending dollar local cost financing the Mission considered the following alternatives:

1) an increase in Borrower's contribution to the project;

2) an increase in the State of Minas Gerais contribution to the project;

3) reducing the number of residencies to be covered.

4) direct contribution by GOB.

1) Increase in Borrower's Contribution

5.05 - The following table sets forth the sources and application of funds of the Borrower from 1959 through 1967:

DER/MG
SOURCE AND APPLICATION OF FUNDS
SOURCES
(Cruzeiros in Billions)

	ACTUAL						CONSTANT		
	1959	1960	1961	1962	1963	1964	1965	1966	1967
National Highway Fund	0.8	0.9	2.1	3.0	5.4	10.2	25.1	26.7	28.3
National Paving Fund	0.1	0.3	0.3	-	-	-	-	-	-
Budgetary State Allocation	1.7	1.4	1.5	4.1	3.8	22.1	25.1	26.7	28.3
USAID Feasibility Study Grant & Equipt. Loan	-	-	-	-	-	-	27.3 /4	-	-
Others /5	.8	.8	1.3	7.2	8.9	6.0	2.6	7.0	3.0
TOTALS	3.4	3.4	5.2	13.3	18.1	38.3	82.0	54.1	64.6
	EXPENSES 1959 - 67								
Administration	.5	.6	.9	1.3	2.4	.0	5.6	5.9	6.2
Maintenance	.4	.5	.8	1.6	3.3	9.5	19.9	24.1	30.2
Capital Investment	.01	.01	.3	.6	.3	3.3	26.1	6.4	12.4
Construction	1.3	1.5	1.8	2.8	4.3	10.6	27.5	17.5	15.3
Debt Service	.8	.5	1.1	4.1	3.8	2.4	2.6	.5	.5
Year End Bal.	.5	.5	.3	.6	.7	/1	.3	/2	/2
Reimbursable Exps.	-	-	-	2.3	3.3	9.2	-	-	-
Total Expenses (Cash Out-Flow)	3.4	3.4	5.2	13.3	18.1	38.3	82.0 /4	54.1	64.6
Maintenance Total	12%	18%	23%	17%	21%	24%	56.1%	56%	66%
Const. to total	38%	44%	35%	40%	41%	50%	33.6%	32%	24%

NOTE: Expenses (cash out-flow) for 1959-64 expressed in actual Cr$; 1965-67 in constant Cr$

/1 Year end balance not available
/2 Year end balances for future years not predicable.
/3 A more detailed description of the sources of funds is included in Annex III.
/4 Plus U.S. $7.5 million for foreign exchange costs.
/5 Includes income from concessions and work done on private roads, etc.

Included in the 1965 expenditures under Capital Investment and Maintenance is the major financing for this project. The DER's contribution is included in both CY65 and CY66. As is shown in the Financial Analysis, paragraph 5.01, the DER will invest in CY65 Cr$31.5 billion and Cr$5.9 billion in CY66 to complete their total investment for this project.

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5.06 - As shown in the table, it is anticipated that income from the National Highway Fund will be Cr$15.1 billion over and above what it was in 1964. This large increase comes as a result of increased taxation on motor fuels and lubricants. The other source of DER/MG funds is the State Matching Fund which requires that, in addition to the State quota of the National Highway Fund, the DER is to be provided with an equal amount from the State's Economic Recovery Tax (previously discussed in the Economic Section). It should be noted that in three out of the five years between 1959-1964 the State's contribution exceeded the amount of funds derived from the National Highway Fund. While the increase in the DER's income is substantial, it should be noted that in previous years, the State had insufficient income to carry out adequate maintenance and construction programs. Even with the increased receipts, the DER will need substantial financial assistance to carry out contemplated investment programs.

5.07 - The estimates used in the source and application of funds are based on September 1964 projections, and later projections by both the DNER and Ministry of Planning show a higher level of receipts. Actual receipts, however, by the DNER for the first three months are stated to have been slightly less than the projections used here. In view of this and the relative stability of the exchange rate since these projections were made, the Mission considers it prudent to rely on the more conservative projections. However, to the extent that revenues exceed the projections, the DER will be able to reschedule the procurement which has been cut from the project.

5.08 - It should be further noted that in the period 1959 through 1964 the level of spending for maintenance was far below acceptable U.S. practice. Highway practice in the U.S. is for maintenance expenditures to constitute 30-50% of total State Highway Department budgetary expenditures per year. As is apparent from the above table in the 1959-1964 period, in not one year did the level of maintenance expenditures achieve this level. Rather, the major part of revenues were applied to construction. As is indicated in the table, the anticipated expenditures for 1965-1967 show a considerable departure from this pattern. The total to be expended for maintenance as a percentage of total budgetary expenses of the DER amounts to 56%, 56% and 66% annually. At the same time the percentage of expenditures on construction substantially declines during the same period. Indeed, in arriving at its 1965 budget the DER cut back the level of projected expenditures for construction by 50%, applying a greater percentage of its own funds to maintenance thus increasing its percentage contribution to this project. Included in Annex III is a detailed report showing the cost of highway construction 1959-1964, and the original and revised construction plan which includes the roads by number to be "constructed" in 1965.

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5.09 - The Mission considers it unwise to force DER to seek any further out-backs in construction expenditures to increase its participation in this project. The distinction between construction, maintenance, and improvement is hazy at best. In examining the construction program of the State it appears to consist of improvements of existing highways which are sub-standard in geometrics and inadequate for present and anticipated traffic.

5.10 - Moreover, the World Bank is contemplating a program of highway construction concentrated in three States: Minas Gerais, Rio Grande do Sul, and Parana. In Minas Gerais the Bank is likely to undertake financing of the construction of MG-4. A feasibility study for this road is being financed by A.I.D. with a PL 480 grant. The State will be expected to fund 50% of the cost of the project. Although some part of this may consist of a special budgetary appropriation by the State, the Mission feels that it is wise to leave the State with a margin of flexibility for construction expenditures in the next 3 years.

The World Bank's strategy in terms of Brazil's transport problem is to assist in the construction of roads in the three key states noted above. The Mission's strategy is assisting in developing the capability of selected states to adequately maintain existing roads and any additional kilometerage that may be added in the foreseeable future. The strategy therefore, of the World Bank is clearly complimentary of that of the Mission.

Beyond financing the purchase of additional highway main-p tenance equipment the Missions strategy clearly includes the establishment of institutional changes to assist Brazil in developing the level of administrative and operational sophistication and competence in the area of highway maintenance so that future replacement or addition of such maintenance equipment will be adequately scheduled and funds made available on a timely basis without further loan assistance. These institutional changes include modifications in hiring practices, record keeping, budgeting: the installation of realistic in-service training programs to insure the availability of required skills necessary to effectively operate and maintain both the State's road network and the Department's equipment.

5.11 - The possibility of the State receiving a larger share of the National Highway Fund was also considered. The National Highway Fund is based on a Federal Tax on motor fuels and lubricants. It originated with Federal Decree-Law No. 2,615 of September 20, 1940. The law has been modified several times over the years, however, from 1953 to 1964 it was not changed, and revenues from the NHF (National Highway Fund) did not keep pace with increasing costs. The fund is administered by the National Highway Department (DNER) and supervised by the National Highway Council. It is distributed in accordance with the basic law as follows:

40% to the Federal Government (DNER)
48% to the States and the Federal District
12% to the municipal Governments

The State quotas are apportioned according to area, population and consumption of petroleum products. Over the past five years Minas Gerais received an average of 10.48% of the 48% available to the States. Only Sao Paulo with 25% receives a higher share. Based on an analysis, of the Fund and how it operates the Mission concluded that additional contribution to the project from this source is not administratively or legally feasible.

2) Greater State Participation

5.12 - As noted in the Economic Analysis the major source of State revenues is derived from the Economic Recovery Tax. In November 1964 this tax was increased to 8%. The allocation of these funds by sector is shown in the Economic Analysis. As is indicated in that Section, the highway

sector receives the largest percentage of these funds. In previous years the National Highway Fund was not adjusted to reflect the rate of inflation on a realistic basis. Thus, the State, along with other States, received an unrealistically low contribution from this Fund. In order to compensate for this inadequacy the State appropriated out of its own funds more than the equivalent of funds received from the National Highway Fund. At this time, of course, the State, in matching the DNER contribution to the State, will be increasing its contribution to the DER by about 50% in real terms. It would be difficult to argue that the State is applying its funds in such a rational manner that no displacement of the existing pattern of investment is justified. Nevertheless it appears that a reasonably rational investment effort is being made by the State. The State's provisional budget projected an unfunded deficit of about Cr$48 billion, and while the State will undoubtedly, as in past years, cut back its program and obtain additional financing, it is the opinion of the Mission that a larger State appropriation to the highway department is not possible. The State has already cut back its construction program for 1965 by 50% and has deferred other investment in order to invest the equivalent of $21.4 million or Cr$ 39.6 billion.

3) Reducing the Scope of the Project

5.13 - The application requests the purchase of highway maintenance equipment which when added to the usable equipment already owned by DER/MG will provide a reasonable amount of basic equipment for each of the 30 maintenance residencies and also the shop tools necessary for equipment maintenance and repair to fully meet the maintenance requirements of the present road system and will suffice for the foreseeable future. A schedule of assignment of equipment to residencies has been prepared by the State and is included as an Exhibit in Annex III. The needs of each residency were determined based on the kilometrage of roads to be maintained for some items of equipment such as trucks, motor-graders, loaders, etc., and the remainder as complementary to the above or on personnel needs for proper supervision of operations. Equipment for pavement, repair and maintenance has been requested only for those residencies having asphaltic surface highways. In cutting back the financial plan to its present level, the project has been pared to the point where further elimination of equipment would transform the project into a procurement plan. The reduction thus far accepted is being done in such a way that a balanced mix of equipment will be maintained; however, the Mission considers that further cuts would tend to defeat the purposes of the project and would result in a reduction of the benefits to be accrued from the project. It is now anticipated that the DER will be able to procure the eliminated equipment in CY 1968, and perhaps if revenues are greater than expected, some of such equipment in CY 1967.

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4) Reducing the Number of Residencies

5.14 - Additionally, the Mission explored the possibility that the project need not cover the entire State, or all of the 30 residencies. However, in November 1964 the Mission had under consideration a proposal for maintenance equipment for the 9 State Highway Departments of the Northeast. Minas Gerais at that time presented an application to cover only the Northern most sparsely settled residencies without reference to the remainder of the State. This application was returned to the State with the advice that A.I.D. preferred to consider an integrated State Plan for highway maintenance. To argue now for partial financing would be inconsistent with the position previously taken and would discourage the kind of integrated planning that the Mission is attempting to encourage at both the Federal and State levels. Additionally, such a cut-back would serve to exclude certain residencies from achieving the objectives of the project.

5.15 - The Mission considered a direct contribution by the GOB to this project to reduce the level of AID financing required and to thereby complete the financing required for the total project. It was decided that it would be impractical to require the Federal Government to make a direct contribution to this State project in view of overall Federal development plans which have been coordinated with the Ministry of Planning. As is discussed in paragraph 5.11, an additional contribution from the National Highway Fund is not administratively or legally feasible.

5.16 - The terms of the proposed loan are 20 years, 3 year grace period, and interest of 3 1/2% per annum. These terms were developed based on the anticipated usable life of the equipment. In the United States the usable life for this type of equipment would be 10-12 years; in Brazil due to the lower cost of repair the average life is estimate to be 15 years. The interest rate of 3 1/2% is within the repayment capability of the DER and is considered to be a reasonable rate for a non revenue producing project.

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SECTION III - REPAYMENT CAPACITY

6.01 - The annual amortization charge over the life of the Loan will be 931,300. As noted in Annex III, the DER's average annual receipts over the same period are estimated to be Cr$43 billion (or $23 million) a/. The DER should have ample cash to meet its debt obligations, even while maintaining a satisfactory level of normal operations. The Loan Agreement will, however, include a standard covenant to the effect that the Borrower will not incur indebtedness maturing in more than one year without A.I.D. consent.

a/ Cr$1850:1 assuming that this level will be maintained in real terms.

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SECTION IV - IMPACT ON U.S. ECONOMY

7.01 - Of the $15.0 million dollar loan portion of the total A.I.D. dollar loan, $7.5 million participation will be used for purchases of U.S. goods and services. The dollars for local currency portion of the loan is to be spent with subsidiaries of U.S. firms, such as Caterpillar and Barber Greene and Clarke. Such locally manufactured equipment will also require importation of components from the U.S. Accordingly, the Loan will have a favorable impact on the U.S. economy.

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SECTION V - CONDITIONS AND COVENANTS

8.01 - Equipment and services financed under the dollar loan for the project shall be procured from the United States of America.

8.02 - Equipment financed under the dollar for cruzeiro cost portion of the loan shall be procured from Brazil.

8.03 - The Borrower shall employ qualified technical consultants and procurement agents, satisfactory to A.I.D. who will advise and assist in carrying out the project.

8.04 - The Borrower shall provide evidence satisfactory to A.I.D. that his own contribution to the project will be made available as needed; also that funds will be made available for continuing maintenance of the equipment purchased and for continuing operation of the highway maintenance department.

8.05 - The Borrower shall provide evidence satisfactory to A.I.D. that an adequate system to enforce reasonable load limits over the State's highway system has been developed and provisions made for effective enforcement.

8.06 - The Borrower will covenant not to incur indebedness maturing more than one year without AID consent.

8.07 - The Borrower shall provide evidence satisfactory to AID that the maintenance plan developed by the engineering consultant and approved by AID will be fully implemented.

8.08 - The loan shall be subject to such other terms and conditions as A.I.D. may deem advisable.

SECTION VI - IMPLEMENTATION PLAN

9.01 - Technical implementation is covered in Section II-C Engineering Analysis.

9.02 - The DER/MG will submit a financing plan including income projections over the next two years from the National Highway Fund and the State Matching Fund in two columns. One column to show income projected as of January 1965 and the other to show current projections. 30% of any real increase over January 1965 estimates based on the Getulio Vargas Foundation wholesale price index will be applied to the project.

9.03 - Additionally, at the time the Borrower requests AID funds beyond the Cr$9.0 billion already made available under a local currency loan, DER/MG will demonstrate to AID's satisfaction that:

(1) the initial Cr$9.0 billion has been effectively utilized and equipment purchased thereunder adequately absorbed by the Department.

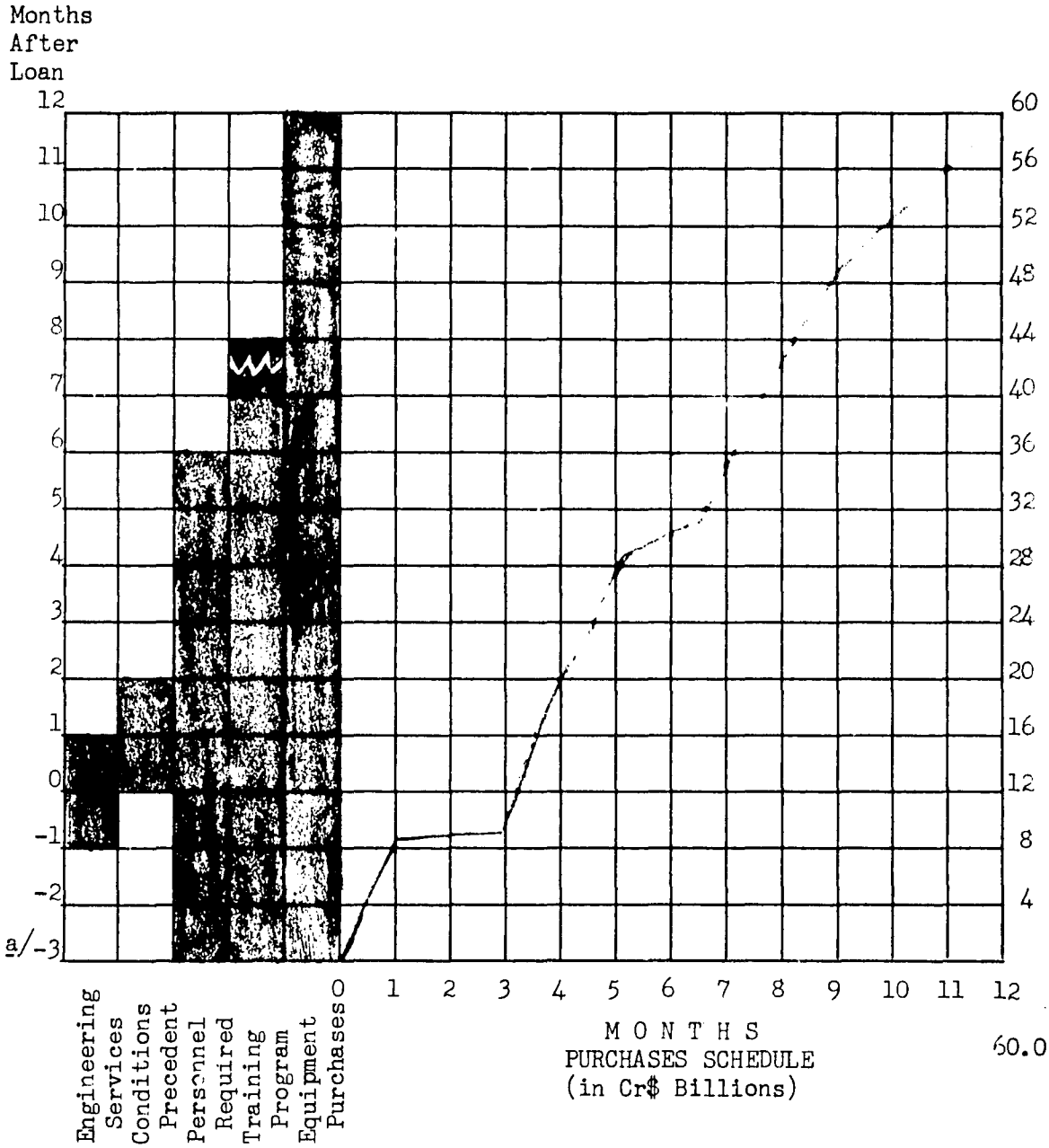
(2) that personnel required to properly maintain and operate the equipment purchased have been either hired and/or upgraded under the training program to effectively utilize the equipment already purchased and the equipment being requested.

(3) that the DER/MG has utilized its funds scheduled as a cash contribution in the financing plan for the project.

9.04 - The attached implementation chart shows the schedule of the twelve month period invisioned for completion of all purchases in Brazil and the United States. These estimates have been based on information collected March 1965 and confirmed in April 1965 following the signing with the Borrower of Cr$9.0 billion. The traiing program as shown on the chart below only indicates at which point the training program will be fully implemented; it of course will continue as a permanent part of the Highway Departments normal operation.

IMPLEMENTATION PLAN

MINAS GERAIS HIGHWAY EQUIPMENT LOAN



a/ Cr$9.0 Billion already signed 4/2/65.

Engineering Services: All consultants' personnel on job before first month; they are already working under existing local currency loan.

Conditions Precedent: All technical CP's already included in Implementation Letter No. 1 for existing local currency loan.

SECTION VII - ISSUE - Dollar Financing of Local Costs

Dollar local cost financing in the amount of $7.5 million is recommended; such financing will amount to 26% of the local costs attributed to the project and is within the estimated amount of indirect import generation as well as the 50% of project local cost financing guideline for project financing.

(a) Inability of the Borrower to Contribute Additional Local Funds to the Project

During the pre-loan discussions which were held with the Borrower during intensive review, the Mission developed a financial plan which in the Mission's judgement is the maximum borrower contribution which can be obtained for the project. Under this plan the Borrower is contributing 65% of the local costs of the project. This contribution (Cr$20.7 billion) from the 1965 budget, amounts to nearly one-third of the total budget for that year. And while next year's allocation for the project is less significant, it should be noted that the state has allocated a substantially larger amount of funds to maintenance operations. In view of the fact that the magnitude of the investment in this project (considerably greater than the State's annual budget), the overall level of external financing for the project is considered to be reasonable.

(b) Non-Availability of U.S. Owned or Controlled Local Currency

It was originally conceived that A.I.D. would finance approximately Cr$12 billion from the 5th PL 480 sales agreement and Cr$18 billion from future PL 480 agreements. As previously discussed, sales of PL 480 wheat under the 5th Agreement have fallen nearly 40% below earlier projections and the likelihood as well as the magnitude of a 6th Agreement is in doubt.

As a result, the PL 480 loan program has been drastically reduced and only Cr$9 billion were available for allocation to this project from the 5th Agreement; this loan has already been signed.

The remaining Cr$18.0 billion would appear to be available from a 6th Wheat Agreement; however the situation is considerably different this year from the past. Brazil has had to honor its trade agreement with Argentina, which resulted in greater Brazilian

purchases of Argentine wheat. The Brazilian domestic wheat production is unexpectedly high. The combination of these two factors alone has resulted in no shipments of U.S. wheat to Brazil for the past six months; and thereby no generations of PL 480 cruzeiros. Under these circumstances a 6th Wheat Agreement is not a reasonable source of funds for this project. There are approximately $35.0 million or 600 tons of wheat still to be shipped under the present fifth wheat agreement. The cruzeiros that will result from these shipments are already allocated and in most instances obligated to high priority projects that have prior claim against the fifth Agreement by virtue of the fact that they were developed first, and firm committments have already been made. Additionally, the schedule of funding requirements, as dictated by the technical implementation, clearly show that this project will be fully financed within twelve months following the signing of the loan agreement.

Cruzeiros that will become available under a contemplated 6th Agreement will not become available for project lending in time to be applied to this project. Moreover, it is doubtful that the level of cruzeiros so generated will be adequate to cover the needs of projects that already have claim on any funds to result from the 6th Agreement.

The USAID has already made tentative reservations of approximately Cr$20 billion, against a possible 6th Agreement for the continuation of the Rio-Sao Paulo and Rio Grande do Sul North Road projects. However, at this date, there is no assurance that currencies will be available for those projects. As is apparent from the above discussions, there are no availabilities of local currency from which to fund additional cruzeiro costs for this project.

(c) Balance of Payments Effects - Brazil

Execution of the project will have indirect effects on the balance of payments. Available information indicates that between 20% to 30% of the cost of highway maintenance and construction equipment produced in Brazil represents imported components, (many of the manufacturers are American owned or licensed). And, while available data are inadequate for accurate calculations of the marginal import rate, the project will create general pressure for additional imports. It is reasonable to expect that the indirect impact on the balance of payments will at least equal the 23% of local costs to be financed through dollar conversion. The recommended level of local financing is considered to be justified.

(d) U.S. Balance of Payments Effect

The dollars to be utilized for local currency financing will be made available only for imports from the U.S. and will be converted under the special letter of credit procedure. Additionally, the financing of local costs of machinery should result in the importation of additional components from the USA. It is anticipated that the level of dollar local cost financing contemplated will not adversely affect the U.S. balance of payments position.

RECOMMENDATION:

It is recommended that dollar local cost financing in the amount of $7.5 million be approved.

May 3, 1965

UNCLASSIFIED
A.I.D.-DLC/P-311
ANNEX I Page 1 of 5

CHECK LIST OF STATUTORY CRITERIA (ALLIANCE FOR PROGRESS)

§ ★ 1. Foreign Assistance Act of 1961, as amended (hereinafter FAA), Section 102. The loan will further the policy of the Act, as stated in this Section. Every possible precaution will be taken to assure that loan proceeds are not diverted to short-term emergency purposes (such as budgetary purposes, balance of payments purposes, or military purposes) or any other purpose not essential to the long-range economic development of Brazil.

§ ★ 2. FAA Section 201(d). Loan funds are not to be loaned or reloaned at rates of interest which are excessive or unreasonable for the Borrower, or higher than the applicable legal rate of interest in Brazil of 12 per cent.

★ 3. FAA Section 202(c), Foreign Aid and Related Agencies Appropriation Act of 1964 (hereinafter "App."), Section 117. Funds have been appropriated by Congress for this loan.

★ 4. FAA Section 204. The terms and conditions of the loan are in accordance with standards and criteria established by the Development Loan Committee.

§ ★ 5. FAA Section 251(a). The loan will promote economic development in Brazil and will contribute to the welfare of its people.

§ 6. FAA Section 251(b)(1). Account has been taken of the extent to which Brazil is adhering to the principles of the Act of Bogota and Charter of Punta del Este and is showing a responsiveness to the vital economic, political, and social concerns of its people, and of the extent to which Brazil has demonstrated a clear determination to take effective self-help measures.

§ 7. FAA Section 251(b)(2). The activity to be financed is economically and technically sound.

§ 8. FAA Section 251(b)(3). The activity is consistent with and is related to other development activities being undertaken or planned and will contribute to realizable long-range objectives.

§ 9. FAA Section 251(b)(4). The loan will have no foreseeable adverse effect on the U.S. economy.

10. FAA Section 251(b). Financing from other free world sources (including private sources within the United States) on reasonable terms for the project is not available.

11. FAA Section 251(b). The terms of the loan (interest, year amortization) are reasonable under circumstances affecting the loan and the capacity of Borrower to repay.

12. FAA Section 251(b). Account has been taken of the extent to which Brazil is making reasonable efforts to encourage repatriation of capital invested in other countries by its own citizens.

13. FAA Section 251(b). There are reasonable prospects that the loan will be repaid.

14. FAA Section 251(e). An application has been received for this loan which gives sufficient information and assurances to indicate reasonably that the funds will be used in an economically and technically sound manner.

15. FAA Section 251(g). In view of the nature of the project, it is not appropriate to utilize the loan to assist in promoting the cooperative movement in Latin America.

16. FAA Section 601(b)(4). N.A.

17. In the implementation of the loan the Mission will approve the Borrower employing private engineering consulting services from United States firms, joint ventures between U.S. and Brazilian firms, wholly owned U.S. subsidiaries, or any qualified Brazilian firm.

18. FAA Section 604(a). Equipment, materials, and services (except Marine Insurance) financed for the project under the loan shall be procured from the United States or Brazil. All U.S. dollars will be utilized for purchases in the U.S.

19. FAA Section 604(b). Any commodities financed by the loan and purchased in bulk will be purchased at prices no higher than prevailing U.S. Market prices.

★ 20. FAA Section 604(d). Loan funds shall be available for Marine Insurance on commodities shipped when such insurance is placed on a competitive basis, as specified in this section of the Act. In the event that Brazil discriminates against any U.S. marine insurance company, commodities purchased with loan funds shall be insured against marine risk with a U.S. company, as required by this section.

§ ★ 21. FAA Section 611(a)(1). Necessary substantive technical and financial planning for the project has been completed, and a reasonably firm estimate of cost of the project to the United States has been obtained.

★ 22. FAA Section 611(a)(2). No further legislative action in Brazil is required for implementation of the project.

★ 23. FAA Section 611(b), App. Section 101. The project does not involve water or related land resource construction.

★ 24. FAA Section 611(c). N.A. No construction contracts will result from the loan.

★ 25. FAA Section 619. Not applicable. Brazil is not a newly independent country.

★ 26. FAA Section 620(a), App. Sections 109(a), 109(b). No assistance will be furnished under this loan to the present government of Cuba, nor does Brazil furnish assistance to the present government of Cuba. Brazil has taken appropriate steps to prevent ships or aircraft under its registry from engaging in any Cuba trade.

★ 27. FAA Section 620(b). The Secretary of State has determined that Brazil is not controlled by the International Communist Movement.

★ 28. FAA Section 620(c). Brazil is not indebted to any U.S.citizen for goods or services furnished or ordered, where such a citizen has exhausted available legal remedies or where the debt is not denied or contested by or the indebtedness arises under an unconditional guaranty of payment given by Brazil.

★ 29. FAA Section 620(d). Loan funds will not finance construction or operation of any productive enterprise which will compete with United States enterprise.

★ 30. FAA Section 620(e). Neither the government of Brazil nor any governmental agency or subdivision thereof has, on or after January 1, 1962, nationalized, expropriated, or seized ownership or control of property of any U.S. citizen or firm, taken steps to repudiate or nullify existing contracts with such citizens or firms, or imposed or enforced discriminatory taxation or other exactions or restrictive conditions, or taken other actions having the effect of nationalizing, expropriating or otherwise seizing ownership or control of property owned by U.S.citizens or firms, as specified in this section of the Act, without taking appropriate steps to discharge its obligations, as specified in this section of the Act.

★ 31. FAA Section 620(f), App. Sections 109(a), 109(b). Assistance provided by this loan will not be furnished to any Communist country.

★ 32. FAA Section 620(g). Assistance provided by this loan will not be used to compensate for expropriated or nationalized property.

★ 33. FAA Section 620(h). Assistance provided by this loan will not be used in a manner which promotes or assists foreign aid projects or activities of the Communist bloc countries.

★ 34. FAA Section 620(i). The President has not determined that Brazil is engaging in or preparing for aggressive military efforts directed against the United States, or any country to which sales are made under PL 480, nor is any basis for such determination known to A.I.D.

★ 35. FAA Section 636(h). Brazil will contribute local currency in the amount of $23.6 million to meet the cost of contractual and other services to be rendered in conjunction with the project. Foreign currency owned by the United States will, to the maximum extent possible, be utilized to meet the costs of contractual and other services for the project.

★ 36. App. Section 102. Obligations of funds in excess of $25,000 for engineering fees to any firms or group of firms financed under the loan will be reported to the committees on appropriations of the Senate and House.

* 37. App. Section 104. Funds obligated by the loan, and local currency generated thereby, will not be used to pay pensions, annuities, etc., as prohibited in this section.

* 38. App. Section 111. U.S. personnel to serve under contracts for services financed by the loan shall have security clearance.

* 39. App. Section 112. Firms which provide engineering, procurement, and construction services financed by the loan for the project, and the terms of their contracts, shall be approved by A.I.D.

* 40. App. Section 114. Loan funds will not be used to make any payment to the U.N.

* 41. App. Section 118. N.A. The project does not call for any construction.

* 42. App. Section 601. Loan funds will not be used for publicity or propaganda purposes within the United States.

AID-DLC/P-311
ANNEX II
May 3, 1965

ENGINEERING DATA

Table of Contents

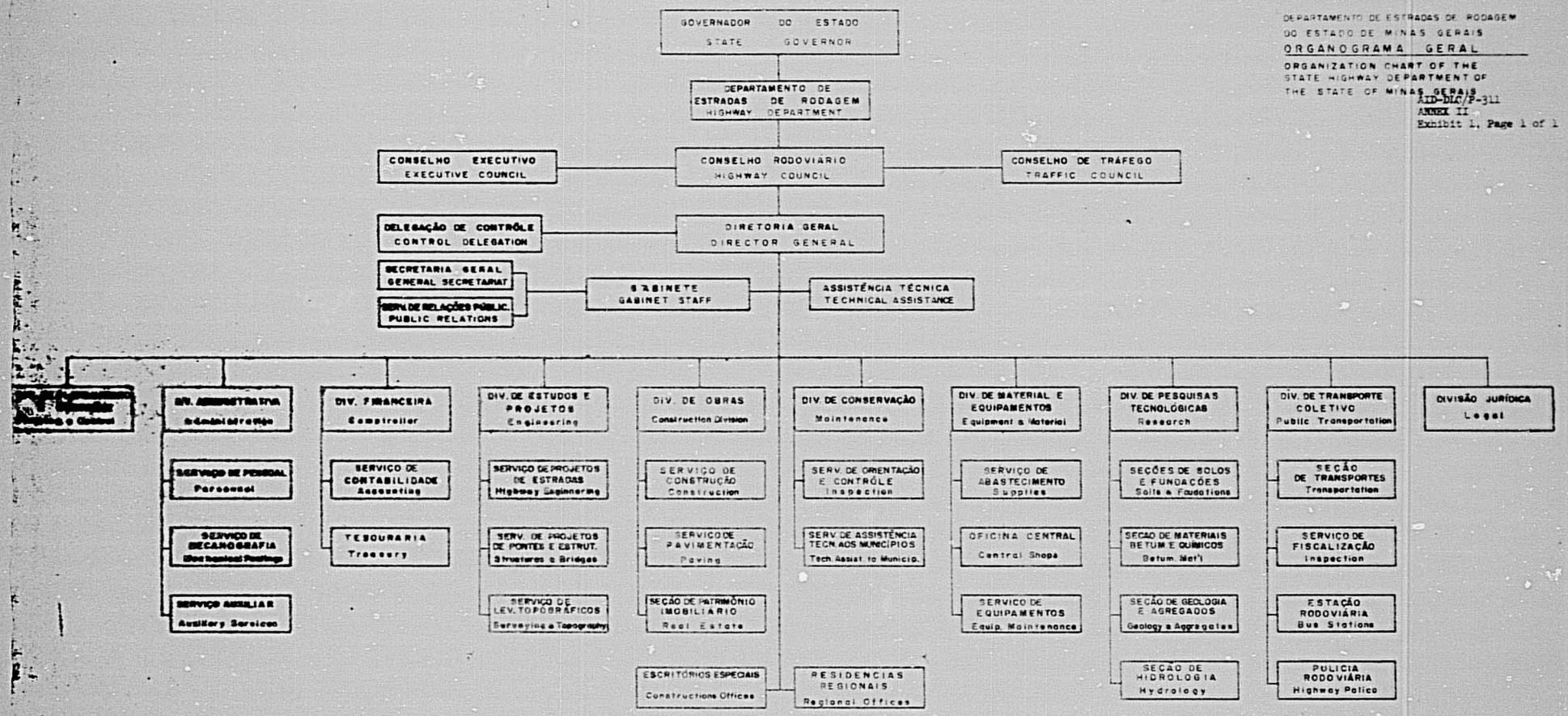
Exhibit 1	DER/MG Organization Chart
Exhibit 2	Training Manual
Exhibit 3	Equipment Requirements
Exhibit 4	Overlay Maps
Exhibit 5	Chart - Road Construction 1959 - 1964
Exhibit 6	Estimated Costs - Vehicles and Machinery
Exhibit 7	Summary Project Costs
Exhibit 8	Economic Benefits

DEPARTAMENTO DE ESTRADAS DE RODAGEM
DO ESTADO DE MINAS GERAIS

ORGANOGRAMA GERAL

ORGANIZATION CHART OF THE
STATE HIGHWAY DEPARTMENT OF
THE STATE OF MINAS GERAIS

AID-DLC/P-311
ANNEX II
Exhibit 1, Page 1 of 1



DEPARTAMENTO DE ESTRADAS DE RODAGEM DO ESTADO DE MINAS GERAIS

DER MG

MANUAL DE TREINAMENTO PARA OPERADORES E MECÂNICOS DE EQUIPAMENTOS DE MANUTENÇÃO

BELO HORIZONTE

ALIANÇA PARA O PROGRESSO

COOPERAÇÃO DA
ALIANÇA PARA O PROGRESSO
BELO HORIZONTE-1965

VEHICLES AND MACHINERY REQUIRED FOR THE ACCOMPLISHMENT OF THE PROPOSED PROGRAM

APPENDIX 12

ITEM	SPECIFIATIONS	CENTRAL SHOP	EQUIPMENT REQUIRED AT EACH RESIDENCE																												TOTAL	COEFFICIENT USED
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
1	6-Passenger, 3/4-ton Pick-up Truck ("Aeronas" type)		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	30	1/Residence
2	3-Passenger, 3/4-ton Pick-up Truck (M-100, C-1404 type)	3	2	2	2	2	2	3	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	3	63	2/Residence 1/Field Shop
3	3-Ton Conventional Gasoline Truck (M-350 type)		4	2	4	4	2	3	3	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	3	3	2	2	71	1/200 km.
4	6-Passenger Station Wagon (Rural Willys type)		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	30	1/Residence
5	6/7-Ton Diesel Rear Dump Truck (LPV-321, P-600 type)		31	24	35	32	30	26	26	30	24	16	13	20	16	24	11	12	21	23	16	20	16	22	21	13	19	21	29	25	14	16	636	1/21 km
6	6/7-Ton Conventional Diesel Truck (LAP-321, P-600 type)		3	3	4	3	2	3	3	3	3	2	2	2	2	3	2	1	2	2	2	2	2	2	2	2	2	2	3	3	2	2	71	1/221 km.
7	6/7-Ton Diesel Truck with field lubricating equipment (LPA-321, P-600 type)		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	30	1/Residence
8	10,000-Liter Water Tank Truck (D11000, L-76 type)		6	6	9	8	5	7	7	8	6	4	4	5	4	6	4	3	5	6	4	3	4	6	3	4	3	4	6	5	3	4	163	1/100 km.
9	10,000-Liter Fuel Tank Truck (D-11000, L-76 type)		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	30	1/Residence
10	100/130-HP Motorgraders (M-70, 1D-D, NV-12 type)		6	6	9	8	5	7	7	8	5	4	4	5	4	6	4	3	5	6	4	3	4	6	3	4	3	4	6	5	3	4	163	1/100 km.
11	2-cu.yd. Wheel Loader (TL-16, [illegible] type)		4	4	5	5	3	4	4	5	4	3	3	3	3	4	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	101	1/[illegible] km.
12	1-1/2 cu.yd. Crawler Tractor [illegible] (TD-20, 355 type)		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	30	1/Residence
13	35/50HP Crawler Tractor with [illegible] and front 3/4 cu.yd. bucket ([illegible] TD-340 type)		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	30	1/Residence

VEHICLES AND MACHINERY REQUIRED FOR THE ACCOMPLISHMENT OF THE PROPOSED PROGRAM | ANNEX X 2

ITEM	SPECIFIATIONS	CENTRAL SHOP	EQUIPMENT REQUIRED AT EACH RESIDENCE																														TOTAL	COEFFICIENT USED
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
14	120/150HP Crawler Tractor w/Angledozer (HD-11EC, D6-C Power Shift type)		4	3	5	4	3	3	3	4	3	2	2	3	2	3	2	2	3	3	2	2	2	3	3	2	2	2	3	3	2	2	32	1/200 km.
15	8/10-Ton Tandem Rollers		2	2	2	2	1	2	2	2	2	1	1	1	1	2	1	1	2	2	1	1	1	1	2	1	1	1	2	2	1	1	44	1/400 km.
16	Sheep Foot Rollers, 1.00 m. diam.		2	2	2	2	1	2	2	2	2	1	1	1	1	2	1	1	2	2	1	1	1	1	2	1	1	1	2	2	1	1	44	1/400 km.
17	30 m^3 per hour Jaw Crusher		2	2	2	2	1	2	2	2	2	1	1	1	1	2	1	1	2	2	1	1	1	1	2	1	1	1	2	2	1	1	44	1/400 km.
18	Air Compressor w/3 or 4 Jack Hammers		2	2	2	2	1	2	2	2	2	1	1	1	1	2	1	1	2	2	1	1	1	1	2	1	1	1	2	2	1	1	44	1/400 km.
19	30-Ton Tractor-Trailer		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	30	1/Residence
20	Radio Transmitter and Receiver 6 MC/seg.		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	60	1/200 km.
21	Wheel Tractor (DM-75, CHT type)		4	4	4	4	2	4	4	4	4	2	2	2	2	4	2	2	4	4	2	2	2	2	4	2	2	2	4	4	2	2	88	1/200 km.
22	Breakdown Truck w/winch for 10 ton	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	31	1/Shop
23	Portable asphalt plant for hot mixture																																	*
24	repair		1			1	1		1		1	1	1				1		1		1	1										1	12	1/Residence
25	600 gal. Asphalt kettler		1			1	1		1		1	1	1				1		1		1	1										1	12	w/paved roads
26	60 kva diesel electric set	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	31	1/Shop

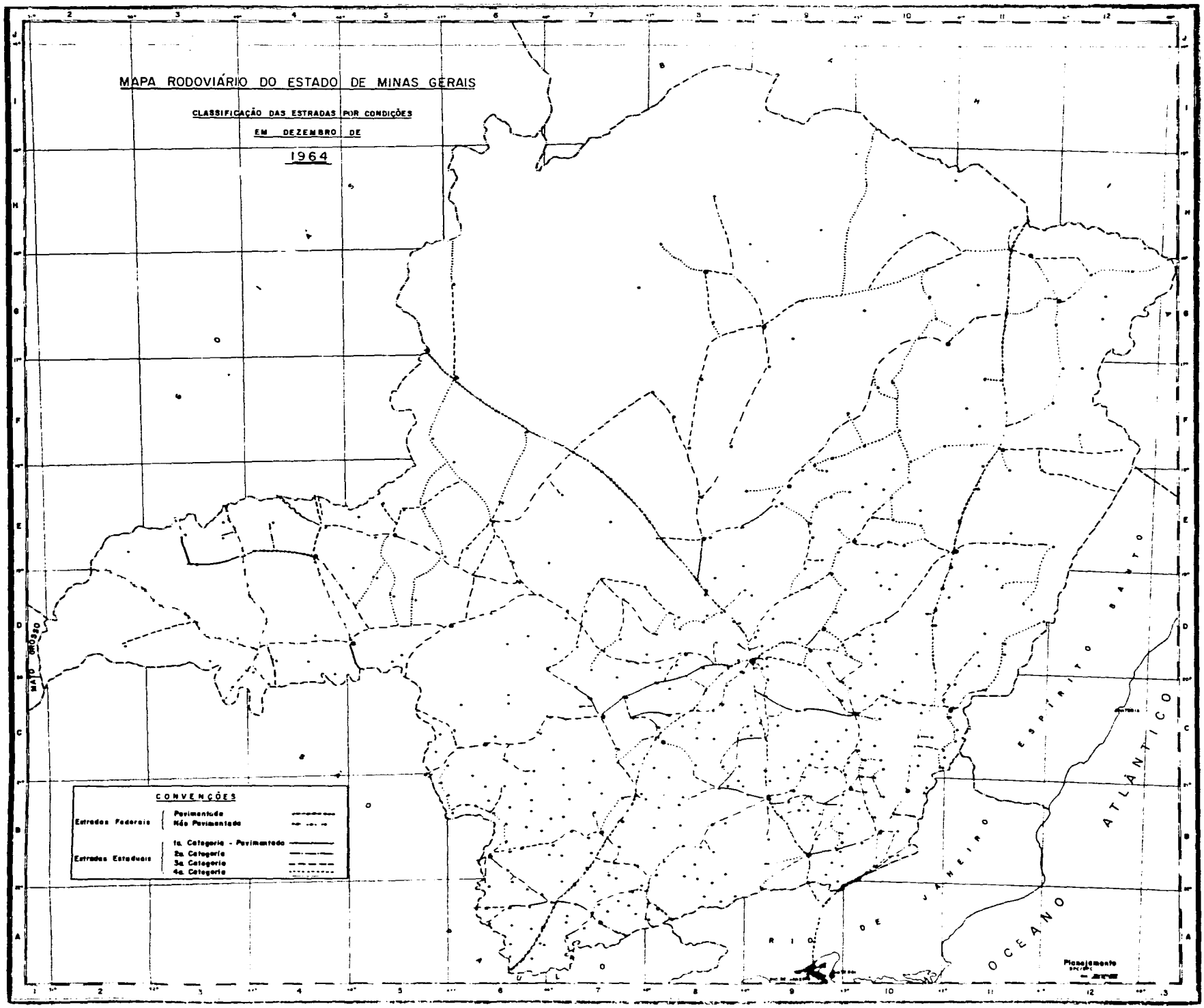
ANNEX II
Exhibit 3, Page 2 of 5

TOOLS AND SHOP EQUIPMENT REQUIRED FOR THE ACCOMPLISHMENT OF THE PROPOSED PROGRAM.

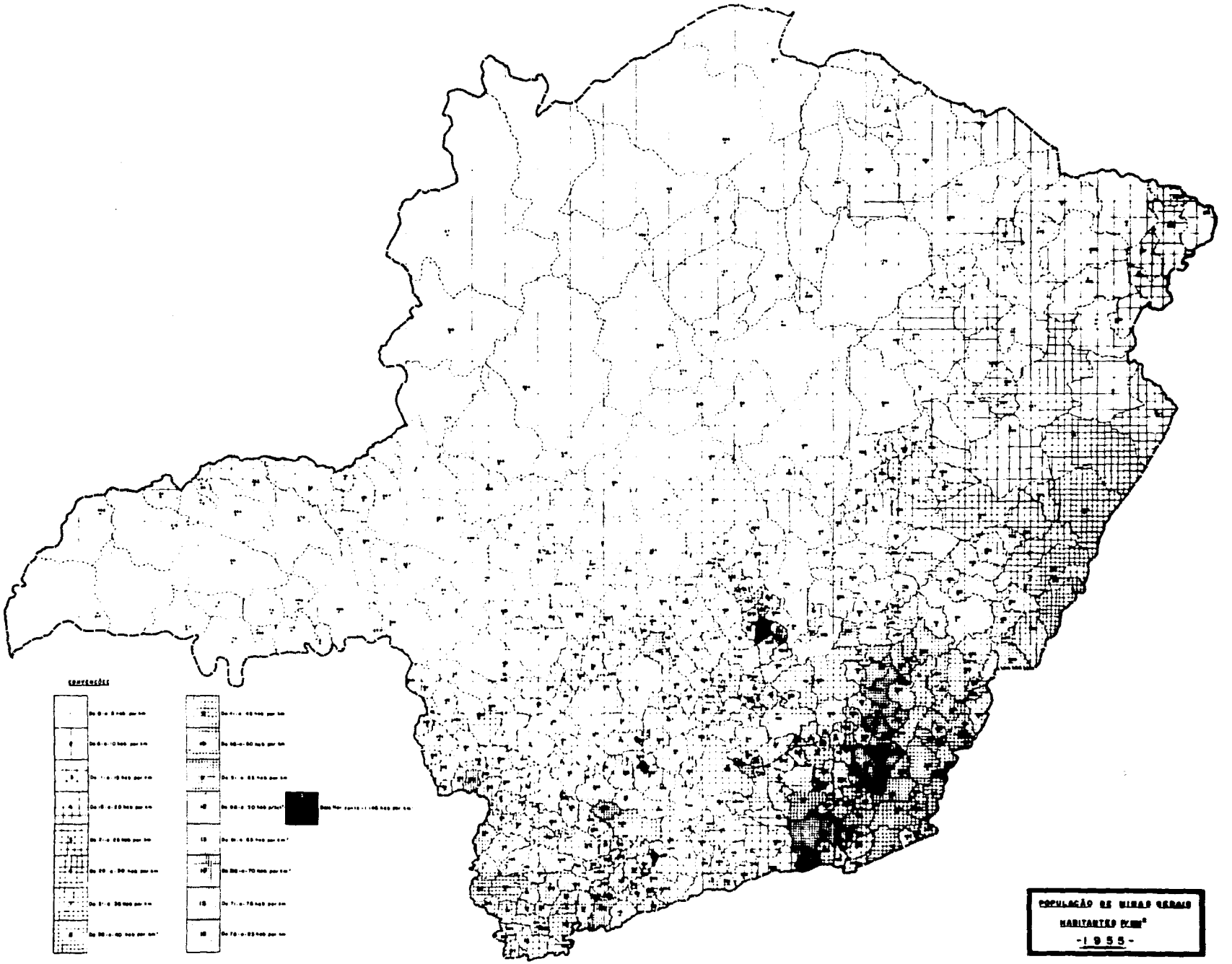
ITEM NO.	DESCRIPTION	AT EACH RESIDENCE SHOP (x25)	AT CENTRAL SHOP AND RESIDENCE NO. 6,10,11, 23,30 (x6)	TOTAL
1.	Crankshaft Regrinding Machine	-	1	6
2.	Crankshaft Balancing Machine	-	1	6
3.	Magnaflus Test	-	1	6
4.	Universal type Line Boring Machine	-	1	6
5.	Cylinder Boring Bar	-	1	6
6.	Cylinder Hones	-	1	6
7.	Connecting Rod Boring Machine	-	1	6
8.	Connecting Rod Aligner	-	1	6
9.	Honing Machine for Connecting Rod Bushing	-	1	6
10.	Surface Regrinding Machine (Heads and Cylinder Blocks	-	1	6
11.	Universal Milling Machine	-	1	6
12.	Micrometer Set (Inches) Up to 6"	1	2	37
13.	Micrometer Set (cm.) Up to 15 cm.	1	2	37
14.	Piston Grinding Machine	-	1	6
15.	Wheel Dressing Machine	-	1	6
16.	Lathe, 2.50 m.	-	1	6
17.	Lathe, 1.50 m.	1	1	31
18.	Lathe, 0.60 m.	-	1	6
19.	Horizontal Shaper 0.60 m. Stroke	-	1	6
20.	Fuel Injection Pump Test Stand	-	1	6
21.	Injector Test Set	1	2	37
22.	Vertical Drilling Machine (Up to 1")	1	1	31
23.	Valve Face Grinding Machine	1	1	31
24.	Valve Seat Grinding Machine	1	1	31
25.	Hydraulic Jack, 10-ton	1	2	37
26.	Floor Hoister on Wheels w/Chain Blocks	1	2	37
27.	Bench Grinder, 1HP	-	1	6
28.	Dinamometer	-	1	6
29.	Brake Band Riveting Machine	1	1	31
30.	Power Hacksaw, Stroke up 6"ϕ Material	1	1	31
31.	Compression Tester (Gasoline and Diesel	1	1	31
32.	Set of Torque Wrenches up to 300 lb. ft (1/4", 1/2", 3/4")	1	2	37
33.	Planing Machine, 0.80 m. Stroke	-	1	6
34.	Bench Grinder, 1/2 HP	1	2	37
35.	Pedestal Grinder, 3 HP	1	1	31
36.	Brake Drum Lathe	-	1	6
37.	Heat Treatment Furnace (Cementation)	-	1	6
38.	Portable Electric Drill, 1/2"	2	3	68
39.	Portable Electric Drill, 5/8"	1	2	37
40.	Electric Welder, 350A	1	1	31

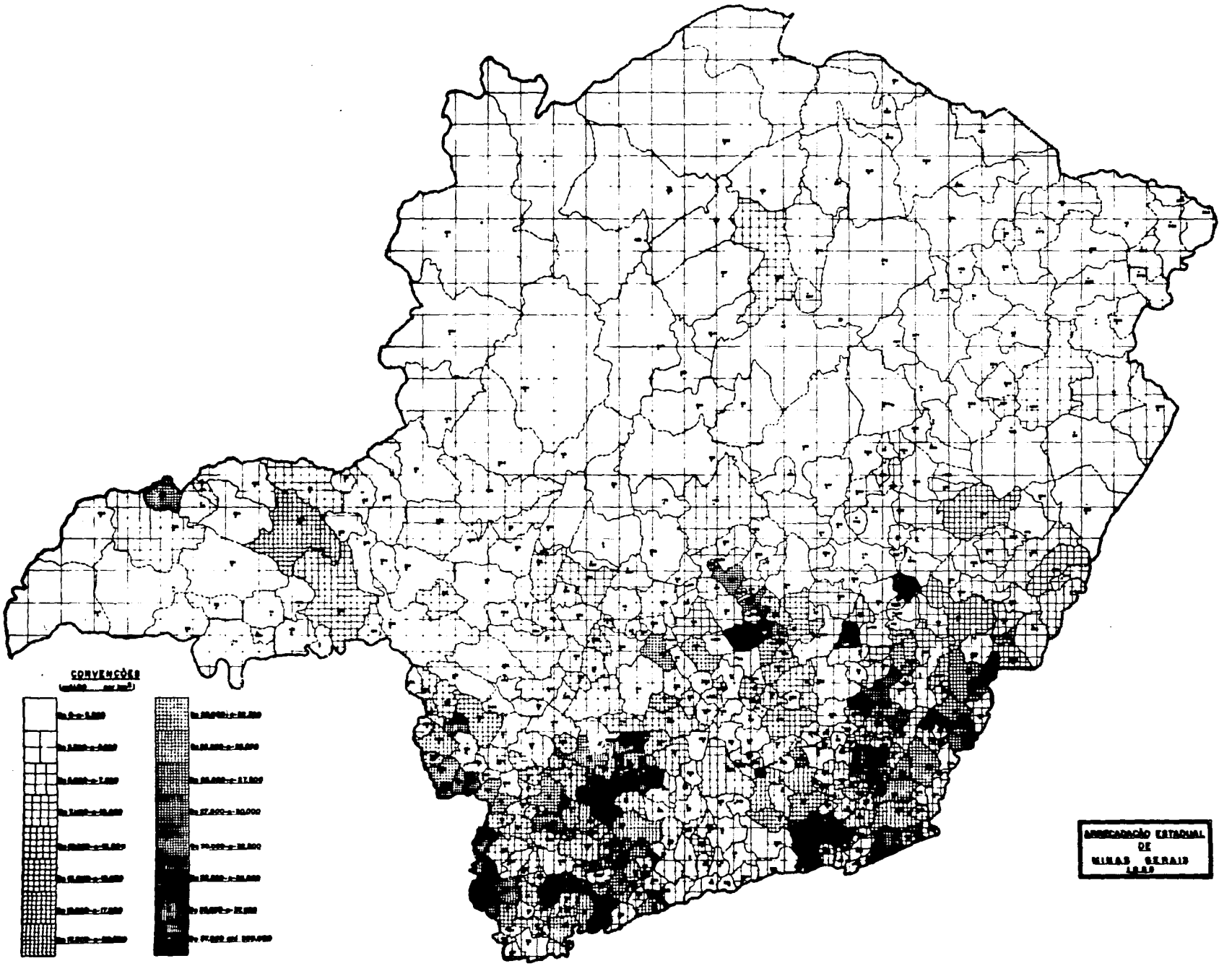
ITEM NO.	DESCRIPTION	AT EACH RESIDENCE SHOP (x25)	AT CENTRAL SHOP AND RESIDENCE NO. 6, 10, 11, 23, 30 (x6)	TOTAL
41.	Acetylene Welding Set (2Kg. charge)	1	1	31
42.	Acetylene Welding Set (6 Kg. charge)	1	1	31
43.	Hydraulic Press, 60-Ton	1	1	31
44.	Hand Press	1	1	31
45.	Air Compressor, 150 CFM	1	1	31
46.	Air Compressor, 300 CFM	-	1	6
47.	Hydraulic Jack on Wheels, 10-Ton	1	2	37
48.	Hydraulic Jack, 6-Ton	1	2	37
49.	Battery Charger, 12 Batteries, 12V	1	1	31
50.	Spark Plug Cleaner and Tester	1	1	31
51.	Universal Electric Test Stand	-	1	6
52.	Tachometer	1	2	37
53.	Electric Blower, 1/4 HP	1	1	31
54.	Electric Shears for Sheets, 1.30 M. x 1/8"	-	1	6
55.	Hand Shears	1	1	31
56.	High Pressure Water Pump	1	2	37
57.	Hydraulic Elevator, 12-Ton	1	1	31
58.	Tube Vulcanizing Machine	1	1	31
59.	Tire Pressure Gauge	2	3	68
60.	Gasoline Filling Pump	1	1	31
61.	Diesel Filling Pump	1	1	31
62.	Portable Electric Shears for Metal Plates	-	1	6
63.	Rotary Polisher (Body Work)	1	1	31
64.	Body Tools	1	1	31
65.	Tool Kit Master Mechanic	2	3	68
66.	Pusher and Puller Set (Small and Large)	1	1	[illegible]
67.	Anvil, 40 Kg.	1	1	[illegible]
68.	Portable Spot Welding Machine	1	1	31
69.	Calendar for Plates	-	1	6
70.	Hydraulic Straightener for Body Work	1	1	31
71.	Paint Spray Gun	1	2	37
72.	Press Brake	-	1	6
73.	Hand Filling Pump for Transmissions	2	3	68
74.	Grease Gun, Compressed Air	2	3	68
75.	Thicknesser	1	1	31
76.	Spindle Molder	1	1	31
77.	Wood Plane	1	1	31
78.	Circular Wood Saw	1	1	31
79.	Chain and Chisel Mortiser	1	1	31
80.	Band Saw	1	1	31

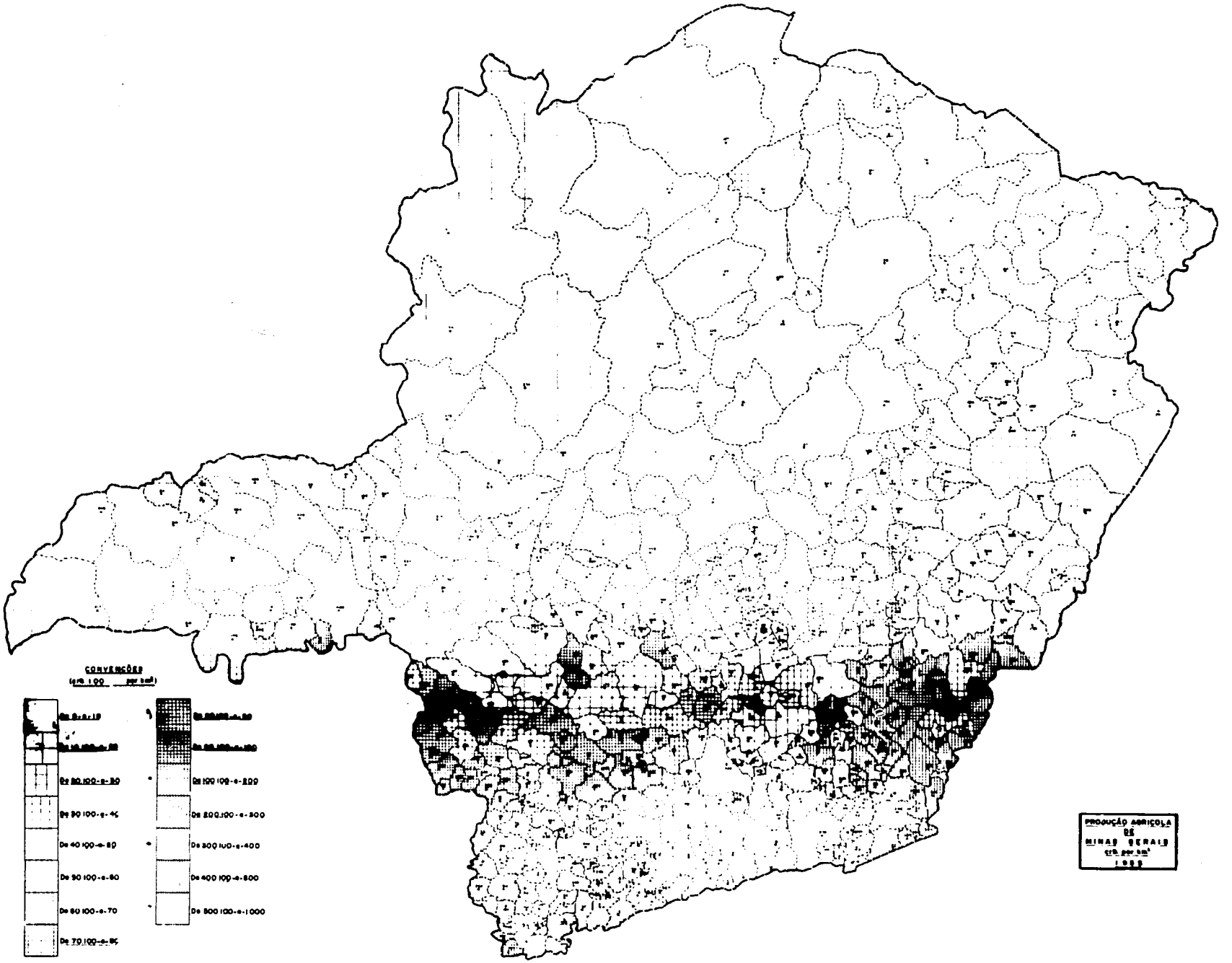
ITEM NO.	DESCRIPTION	AT EACH RESIDENCE SHOP (x25)	AT CENTRAL SHOP AND RESIDENCE NO. 6, 10, 11, 23, 30 (x5)	[illegible]
81.	Tenoner	-	1	6
82.	Belt Sander	1	1	6
83.	Portable Chain Hoist Jig	1	2	37
84.	Hydraulic Track Press	-	1	5
85.	Front End and Wheel (Aligning Machine) w/All Attachments	-	1	5
86.	Impact Wrenches	1	2	37
87.	Filtering Equipment for Diesel Oil	1	1	31
88.	Steam Cleaner	-	1	5

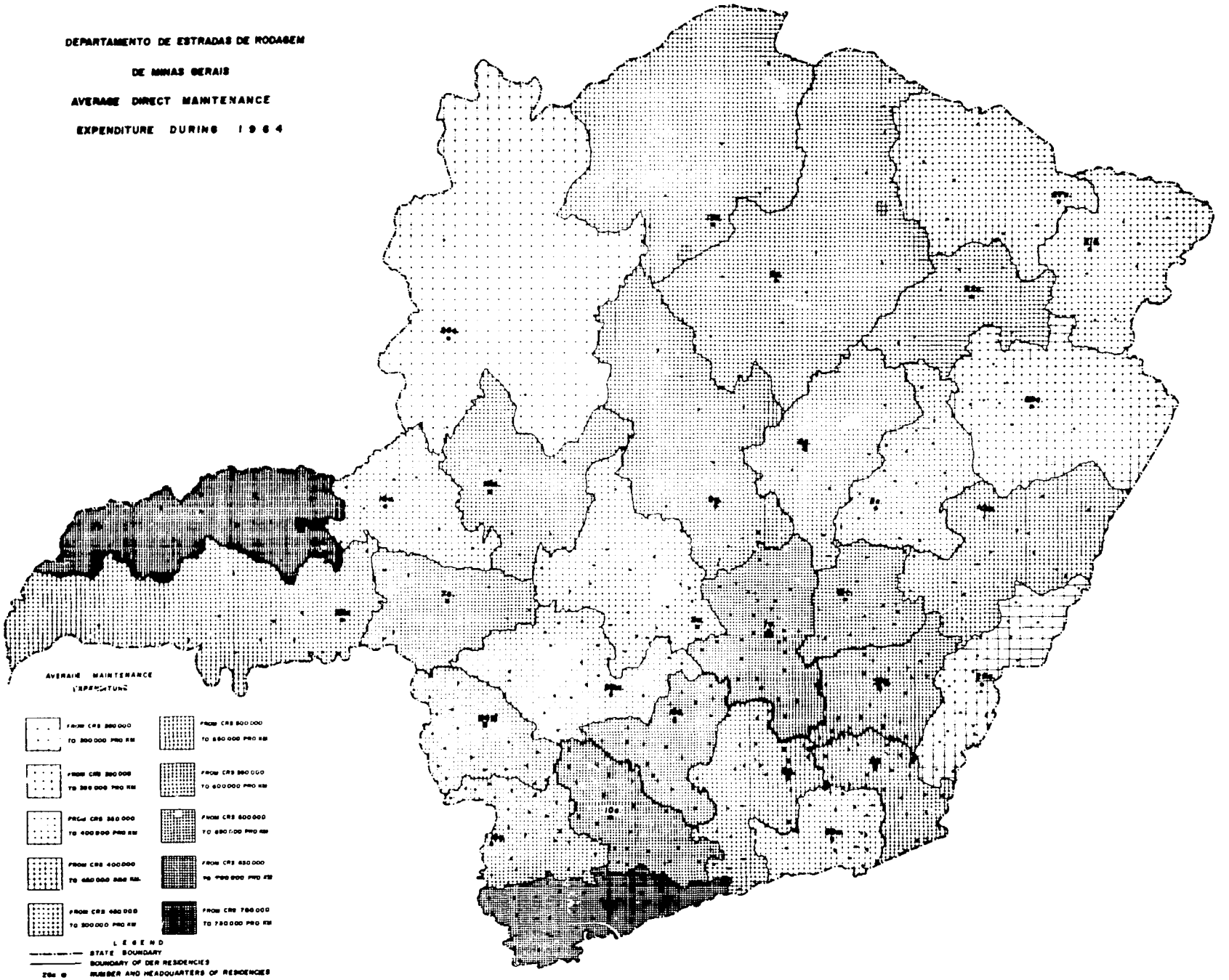


ANNEX II
Exhibit 4,


CONVENÇÕES
POPULAÇÃO DE MINAS GERAIS
HABITANTES P/KM²
-1955-


CONVENÇÕES
ARRECADAÇÃO ESTADUAL
DE
MINAS GERAIS
1.969

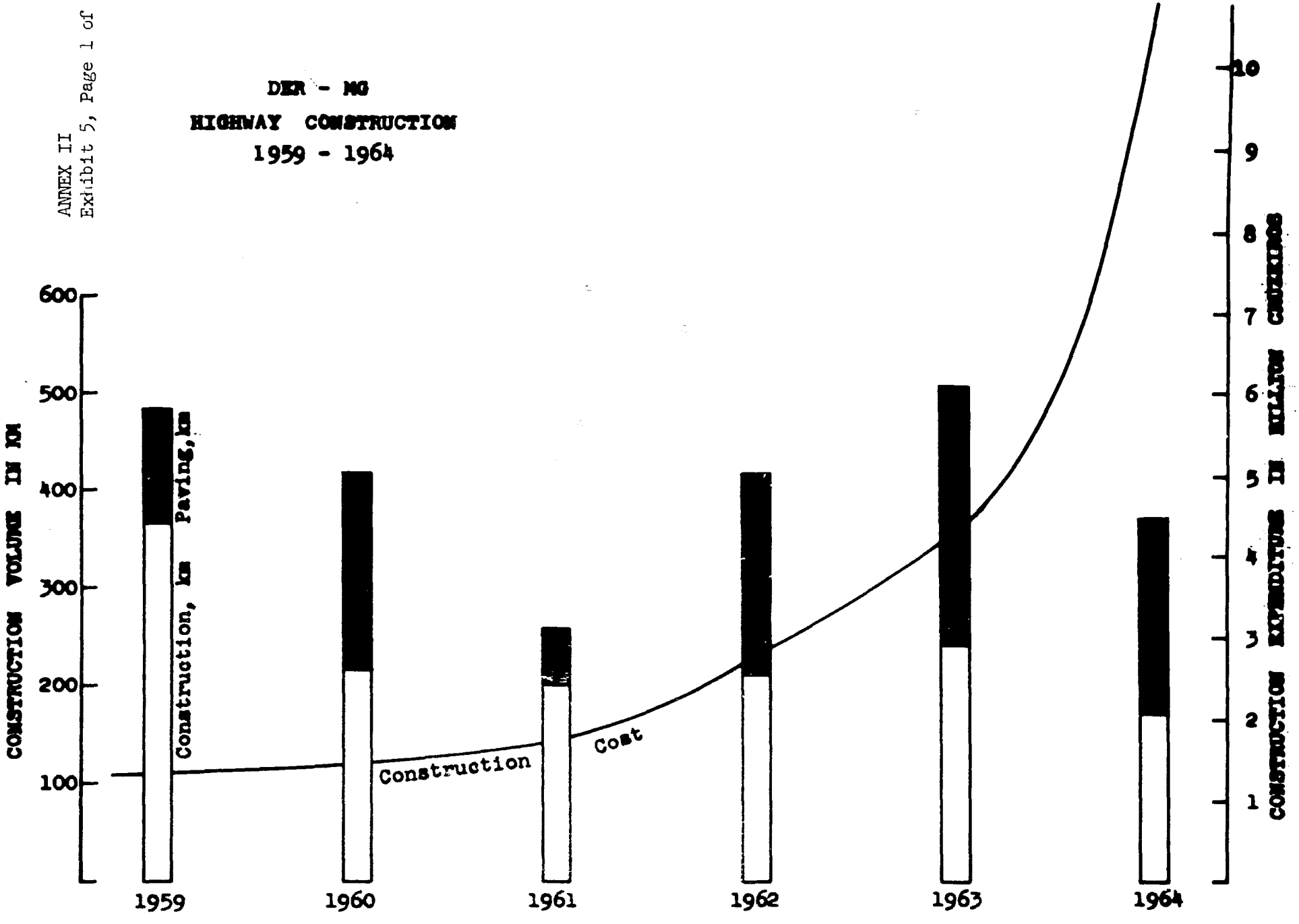

CONVENÇÕES
(cr$ 1.000 por km²)
De 0-a-10
De 10.100-a-20
De 20.100-a-30
De 30.100-a-40
De 40.100-a-50
De 50.100-a-60
De 60.100-a-70
De 70.100-a-80
De 80.100-a-90
De 90.100-a-100
De 100.100-a-200
De 200.100-a-300
De 300.100-a-400
De 400.100-a-500
De 500.100-a-1000
PRODUÇÃO AGRÍCOLA
DE
MINAS GERAIS
cr$ por km²
1969


DEPARTAMENTO DE ESTRADAS DE RODAGEM
DE MINAS GERAIS
AVERAGE DIRECT MAINTENANCE
EXPENDITURE DURING 1964
AVERAGE MAINTENANCE
EXPENDITURE
FROM CR$ 300 000
TO 350 000 PRO KM
FROM CR$ 350 000
TO 400 000 PRO KM
FROM CR$ 400 000
TO 450 000 PRO KM
FROM CR$ 450 000
TO 500 000 PRO KM
FROM CR$ 500 000
TO 550 000 PRO KM
FROM CR$ 550 000
TO 600 000 PRO KM
FROM CR$ 600 000
TO 650 000 PRO KM
FROM CR$ 650 000
TO 700 000 PRO KM
FROM CR$ 700 000
TO 750 000 PRO KM
LEGEND
STATE BOUNDARY
BOUNDARY OF DER RESIDENCIES
NUMBER AND HEADQUARTERS OF RESIDENCIES

DER - MG

HIGHWAY CONSTRUCTION

1959 - 1964



CABLE ADDRESS: BROWNINCOI

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ENGINEERING · ECONOMICS · FINANCE

BROWN & ROOT ULTRAMAR LTDA.
AV. RIO BRANCO, 37 · S/605
FONE: 43-3482

Rio de Janeiro, March 18, 1965

U.S. Agency for International Development
USAID - Mission to Brazil
American Embassy
Rio de Janeiro
Attn: Mr. Lawrence Brailsford
Capital Development Officer

Subject: State of Minas Gerais Highway Maintenance Equipment.

Gentlemen:

With reference to the questions raised regarding the highway program of the State of Minas Gerais in connection with their loan application for the purchase of highway maintenance equipment we wish to submit the following information which was obtained during our work as consultants to the State Highway Department of Minas Gerais (DER-MG):

1. The highway program carried out by DER-MG in past years was as follows:

Year	Construction Km	Paving Km	Maintenance Km
1959	366	116.0	13,744
1960	216	200.5	13,406
1961	201	57.6	13,569
1962	212	206.3	14,381
1963	243	264.8	15,717
1964	171	200.1	15,906

The cost of this work is shown in the financial statements of the DER-MG presented in Tables 8 & 9 of the supplemental report submitted 29 January 1965.

The highway construction program prepared by the Planning Division of the DER-MG for future years was revised because of the precedence of the highway maintenance program and due to financial limitations, as follows:

BROWN & ROOT, Inc.
International Consultants

Year	Priority	Original Plan Construction Km	Original Plan Paving Km	Revised Plan Construction Km	Revised Plan Paving Km
1965	1st	422.5	404.5	422.5	404.5
	2nd	-	282.0	-	-
	3rd	-	313.0	-	-
1966	1st	360.0	727.0	360.0	282.0
	2nd	60.0	84.0	-	-
	3rd	121.0	23.0	-	-
1967	1st	514.0	515.0	181.0	413.0
	2nd	493.0	378.5	-	-

Under the revised program, the following highways are scheduled for construction and paving during 1965:

Route	Section	Total Km	Existing Constr.	Existing Pvmt.	Revised 1965 Program Constr.	Revised 1965 Program Pvmt.
MG-1	Curvelo-Corinto	48.0	43.0	-	5,0	-
MG-4	BR/31-Acesita	86.5	86.5	24	-	-
MG-7	BR/55-Vianópolis	10.0	10.0	-	-	10.0
MG-8	Serra do Salitre-BR/106	155.0	136.5	-	18.5	-
MG-23	Divinópolis-Carmo da Mata	50.0	10.0	-	40.0	-
MG-24	MG/7-Sto. Antônio do Monte	27.0	27.0	-	-	27.0
MG-24	Gonçalves Ferreira-Cláudio	17.5	17.5	-	-	17.5
MG-25	Formiga-BR/55	95.0	58.0	-	37.0	-
MG-25	Arcos-Bambui	60.0	60.0	18.0	-	42.0
MG-54	Ituitaba-Canal S.Simão	110.0	-	-	110.0	-
MG-56	Ouro Prêto-Ponte Nova	80.0	80.0	66.0	-	14.0
MG-59	Lafayette-Piranga	68.5	34.0	-	26.0	-
MG-60	Lavras-S.João del Rei	64.0	43.0	-	51.0	-
MG-108	Lajinha-BR/31	30.0	16.5	-	13.5	-
MG-112	Carangola-Fervedouro	31.0	31.0	-	-	31.0
MG-119	Volta Grande-Pirapetinga	26.0	26.0	21.0	-	5
MG-131	Grama-Uba	97.5	97.5	37.0	-	33.5
MG-157	Coqueiral-Nepomuceno	28.0	-	-	28.0	-
	Monte Belo-Muzambinho	18.0	10.0	-	8.0	-
Connecting Highways	Pompeu-BR/7	43.0	20.0	-	23.0	-
	Dores-Luz	37.0	25.0	-	12.0	-
	Paraopeba-G.Maquiné	27.5	7.0	-	20.5	-
	Lajinha-Mutum	50.0	5.0	-	15.0	-
	Pains-MG/25	20.0	20.0	-	-	20.0
BR-32/78	Campanha-Lambari	40.0	40.0	-	-	40.0
BR-76	Pouso Alegre-Poços de Caldas	90.0	90.0	30.0	-	60.0
BR-82 = MG-22	Leopoldina-Cataguazes	22.0	22.0	-	-	22.0
BR-68	BR/4-Bicas	51.0	36.0	-	15.0	20.0
					422.5	404.5

Please note that the work shown under the heading "construction" generally consists of substitution of existing earth roads, rather than of entirely new construction, and will not result in a corresponding increase in total state highway mileage. Under the policy of the DER-MG, this work is generally performed under contract, since it is beyond the scope of maintenance operations and far beyond the limited capabilities for force-account construction. An indication of the importance of the roads included in the 1965 highway program may be obtained from examination of the economic maps submitted with the supplemental report on 29 January 1965.

2. The revenue of the DER-MG from its share of the federal tax on fuel oils and lubricants was estimated at Cr$ 25 billion on the basis of the prices prevailing in September 1964. As shown in Table 5 of the supplemental report of 29 January 1965, this estimate was revised to account for price increases from September 1964 until January 1965, and to include the effect of future price adjustments as provided for by the federal law regulating the National Highway Fund. Considering the price increase of 27% from September 1964 through January 1965 and allowing 25.6% for the total effect of subsequent price increases during the year, the estimate of the DER-MG allocation from the National Highway Fund has been revised to Cr$ 34 480 billion. This amount has been used in preparing the provisional budgets presented in page 22 and Tables 22 and 23 of the supplemental report.

3. On the basis of a detailed review of existing highways by individual sections, the present extent of the state highway system was found to be 13 850 Km. In addition to these state highways, the DER-MG maintains 2 056 Km of federal and municipal roads, giving a total of 15 906 Km included in the maintenance program. On the basis of our review we concluded that the data quoted from IBGE and Anuário Estatístico are in error.

4. A copy of the approved State Budget is submitted herewith. This operating budget was used as the basis for preparation of the provisional budgets presented in the supplemental report which the DER proposes to adopt upon approval and implementation of the loan application. Provisions for anticipated inflationary price increases of 55% per year have been considered in preparation of the provisional budgets.

Please note that the amounts included in these provisional budgets for acquisition of maintenance equipment under the proposed program have been computed on the basis of the assumption that the first delivery of equipment will take place in May 1965. Because of inflationary price increases, the cost of the proposed local currency purchases is expected to increase by 3.71% or Cr$ 1 168 million per month of later equipment delivery

Very truly yours,

BROWN & ROOT ULTRAMAR LTDA.

Henry G. Thurm
- Project Engineer -

HGT/ba.

Encl.: State Budget
c.c.: DER-MG

B. ESTIMATED COSTS OF REQUESTED VEHICLES AND MACHINERY

ITEM NO.	DESCRIPTION	CALCULATED EQUIPMENT REQUIRED (APP. 12)	EQUIPMENT AVAILABLE		EQUIPMENT REQUESTED	PURCHASES IN Cr$		PURCHASES IN US$	
			BAD CONDITION	GOOD CONDITION		UNIT PRICE Cr$ 1.000,	TOTAL COST Cr$ 1.000,	CIF/RIO UNIT PRICE (US$1.00)	CIF/RIO TOTAL COST (US$1.00
1	6-Passenger, 3/4-ton Pick-Up Truck	30	-	-	30	8.000	240.000		
2	3-Passenger, 3/4-ton Pick-Up Truck (F-100, C-1404 type)	68	-	-	68	7.000	476.000		
3	3-ton Convent. gasoline Truck (F-350 type)	75	-	-	75	7.200	540.000		
4	6-Passenger Station (Rural Willys Type)	30	-	38	-				
5	6/7-Ton Diesel Rear Dump Truck (LPK-321 F-600, C-6503 type)	636	106	166	470	14.000	6580.000		
6	6/7 Ton Convent. Diesel Truck (LAP-321, F-600 type)	71	8	14	57	14.000	798.000		
7	6/7 Ton Diesel Truck w/field lubrificating equipt (LAP-321, F-600 type)	30	-	-	30	19.000	570.000		
8	10,000-Liter Water Tank Truck (D-11000, L-76 type)	163	-	1	162	22.000	3564.000		
9	10,000-Liter Fuel Tank Truck (D-11000, L-76 type)	30	-	-	30	22.000	660.000		

B. ESTIMATED COSTS OF REQUESTED VEHICLES AND MACHINERY

ITEM NO.	DESCRIPTION	CALCULATED EQUIPMENT REQUIRED (APP.12)	EQUIPMENT AVAILABLE		EQUIPMENT REQUESTED	PURCHASES IN Cr$		PURCHASES IN US$	
			BAD CONDITION	GOOD CONDITION		UNIT PRICE Cr$ (1.000,)	TOTAL COST Cr$ (1.000,)	CIF/RIO UNIT PRICE (US$1.00)	CIF/RIO TOTAL COST (US$1.00)
10	100/130-HP Motor grader (M-70, 10-D, NO. 12 type)	163	95	56	107	38.000	4.066.000		
11	2-cu.yd.Wheel Loader (TL-16, 944 type)	101	8	20	81			23,500	1,903,50
12	1-1/2 cu-yd. Crawler Tractor Loader (HD6G, 955 type)	30	20	-	30			18,500	555,00
13	35/50HP Crawler Tractor w/backhoe and front 3/4 cu-yd bucket (HD-3,TD-340 type)	30	-	-	30			13,000	390,00
14	120/150HP Crawler Tractor (HD11EC,D6C Power Shift Type)w/ angle-dozer	82	74	-	82			29,500	2,419,00
15	8/10-Ton Tandem Rollers	44	7	5	39	12.600	491.400		
16	Sheep Foot Rollers 1.00 M. diam.	44	-	-	44	4.000	176.000		
17	30 cu.m/hour Jaw Crusher	44	13	8	36	10.000	360.000		
18	Air Compressor w/3 or 4 Jack Hammers	44	17	5	39	19.000	741.000		

B. ESTIMATED COSTS OF REQUESTED VEHICLES AND MACHINERY

ITEM NO.	DESCRIPTION	CALCULATED EQUIPMENT REQUIRED (APP.12)	EQUIPMENT AVAILABLE		EQUIPMENT REQUESTED	PURCHASES IN Cr$		PURCHASES IN US$	
			BAD CONDITION	GOOD CONDITION		UNIT PRICE Cr$ (1.000,)	TOTAL COST Cr$ (1.000,)	CIF/RIO UNIT PRICE (US$1.00)	CIF/RIO TOTAL COST (US$1.00)
19	30-Ton Tractor Trailer	30	-	-	30	35.000	1.050.000		
20	Radio Transmitter and Receiver 6MC/seg	60	-	-	60	2.000	120.000		
21	Wheel Tractor (DM-75, CBT type)	88	-	-	88	7.500	660.000		
22	Breakdon Truck w/ Winch for 10-Ton	31	-	-	31	18.000	558.000		
23	Portable asphalt plant for mistures repair	12	-	-	12	20.000	240.000		
24	600 gal asphalt kettler	12	-	-	12	7.000	84.000		
25	60 KVA Diesel electric set	31	15	-	31	15.000	465.000		
	TOTAL COST						22.439.400		5,267,500

C. ESTIMATED COSTS OF REQUESTED TOOLS AND SHOP EQUIPMENT

ITEM NO.	DESCRIPTION	CALCULATED EQUIPMENT REQUIRED (APP.13)	EQUIPMENT AVAILABLE		EQUIPMENT REQUESTED	PURCHASES IN Cr$		PURCHASES IN US$	
			BAD CONDITION	GOOD CONDITION		UNIT PRICE Cr$ (1.000,)	TOTAL COST Cr$ (1.000,)	CIF/RIO UNIT PRICE (US$1.00)	CIF/RIO TOTAL COST (US$1.00)
1	Crankshaft Regrinding Machine	6	-	3	3			22,000	66,000
2	Crankshaft Balancing Machine	6	-	-	6			7,000	42,000
3	Magnaflux Test	6	-	-	6	19.500	117.000		
4	Universal type line boring Machine	6	-	1	5			5,500	27,500
5	Cylinder Boring Bar	6	-	-	6			1,700	10,200
6	Cylinder Hones	6	-	1	5			180	900
7	Connecting Road Boring Machine	6	-	1	5			2.800	14,000
8	Connecting Rod Aligner	6	-	-	6			700	4,200
9	Honing Machine for Connecting Rod Bushing	6	1	-	6			2,500	15,000
10	Surface Regrinding Machine (Heads and Cylinder Blocks)	6	-	-	6			10,000	60,000
11	Universal Milling Machine	6	-	2	4	17.500	70.000		
12	Micrometer Set (Inches), Up to 6"	37	-	1	36			300	10,800
13	Micrometer Set (Cm.) Up to 15 Cm.	37	-	1	36			300	10,800

C. ESTIMATED COSTS OF REQUESTED TOOLS AND SHOP EQUIPMENT

ITEM NO.	DESCRIPTION	CALCULATED EQUIPMENT REQUIRED (APP.13)	EQUIPMENT AVAILABLE		EQUIPMENT REQUESTED	PURCHASES IN Cr$		PURCHASES IN US$	
			BAD CONDITION	GOOD CONDITION		UNIT PRICE Cr$ (1.000,)	TOTAL COST Cr$ (1.000,)	CIF/RIO UNIT PRICE (US$1.00)	CIF/RIO TOTAL COST US$1.00)
14	Piston Grinding Machine	6	-	1	5			2,500	12,500
15	Wheel Dressing Machine	6	1	-	6	300	1.800		
16	Lathe, 2.50 M.	6	-	2	4	4.200	16.800		
17	Lathe, 1.50 M.	31	11	16	15	2.500	37.500		
18	Lathe, 0.60 M.	6	-	2	4	1.000	4.000		
19	Horizontal Shaper, 0.60 M. Stroke	6	1	2	4	1.600	6.400		
20	Fuel Injection Pump Test Stand	6	-	1	5			4,800	24,000
21	Injection Test Stand	37	-	2	35			520	18,200
22	Vertical Drilling Machine (Up to 1")	31	13	12	19	1.000	19.000		
23	Valve Face Grinding Machine	31	7	2	29			580	16,820
24	Valve Seat Grinding Machine	31	4	3	28			350	9,800
25	Hydraulic Jack, 10-Ton	37	16	4	33	270	8.910		
26	Floor Hoister on Wheels w/Chain Blocks	37	-	-	37	450	16.650		
27	Bench Grinder, 1HP	6	12	6	-	180			
28	Dinamometer	6	-	-	6			4,000	24,000
29	Brake Band Riveting Machine	31	5	2	29	200	5.800		
30	Lower Hacksaw Stroke Up 6" Material	31	4	2	29	300	8.700		

C. ESTIMATED COSTS OF REQUESTED TOOLS AND SHOP EQUIPMENT

ITEM NO.	DESCRIPTION	CALCULATED EQUIPMENT REQUIRED (APP. 13)	EQUIPMENT AVAILABLE		EQUIPMENT REQUESTED	PURCHASES IN Cr$		PURCHASES IN US$	
			BAD CONDITION	GOOD CONDITION		UNIT PRICE Cr$ (1.000,)	TOTAL COST Cr$ (1.000,)	CIF/RIO UNIT PRICE (US$1.00)	CIF/RIO TOTAL COST (US$1.00)
31	Compression Tester (Gasoline & Diesel)	31	-	1	30			360	10,800
32	Set of Torque Wrenches Up to 300 lb.ft. (1/4", 1/2", 3/4")	37	-	-	37			70	2,590
33	Planing Machine 0.80 M. Stroke	6	-	-	6	3.100	18.600		
34	Bench Grinder, 1/2HP	37	14	11	26	80	2.080		
35	Pedestal Grinder 3 HP	31	1	9	22	380	8.360		
36	Brake Drum Lathe	6	-	-	6	2.800	16.800		
37	Heat Treatment Furnace (Cementation)	6	-	-	6	5.600	33.600		
38	Portable Electric Drill 1/2"	68	11	13	55	150	8.250		
39	Portable Electric Drill 5/8"	37	-	-	37	480	17.760		
40	Electric Welder, 350A	31	12	15	16	1.500	24.000		
41	Acetylene Welding Set (2Kg. charge)	31	18	13	18	600	10.800		
42	Acetylene Welding Set (6Kg. charge)	31	7	2	29	900	26.100		

C. ESTIMATED COSTS OF REQUESTED TOOLS AND SHOP EQUIPMENT

ITEM NO.	DESCRIPTION	CALCULATED EQUIPMENT REQUIRED (APP.13)	EQUIPMENT AVAILABLE		EQUIPMENT REQUESTED	PURCHASES IN Cr$		PURCHASES IN US$	
			BAD CONDITION	GOOD CONDITION		UNIT PRICE Cr$ (1.000,)	TOTAL COST Cr$ (1.000,)	CIF/RIO UNIT PRICE (US$1.00)	CIF/RIO TOTAL COST (US$1.00)
43	Hydraulic Press 60-Ton	31	-	4	27	800	21.600		
44	Hand Press	31	-	-	31	220	6.820		
45	Air Compressor, 150 CFM	31	21	10	21	680	14.280		
46	Air Compressor, 300 CFM	6	7	5	1	1.300	1.300		
47	Hydraulic Jack on Wheels, 10-Ton	37	4	5	32	280	8.960		
48	Hydraulic Jack, 6-Ton	37	16	4	33	250	8.250		
49	Battery Charger, 12 Batteries, 12V	31	18	7	24	520	12.480		
50	Spark Plug Cleaner and Tester	31	1	4	27			65	1,755
51	Universal Electric Test Stand	6	-	-	6			3,100	18,600
52	Tachometer	37	-	-	37	350	12.950		
53	Electric Blower, 1/4HP	31	16	13	18	80	1.440		
54	Electric Shears for Sheets, 1.30M. x 1/8"	6	-	-	6	3.500	21.000		
55	Hand Shears	31	2	-	31	800	24.800		
56	High Pressure Water Pump	37	9	12	25	1.000	25.000		
57	Hydraulic Elevator, 12-Ton	31	-	1	30	3.000	90.000		
58	Tube Vulcanizing Machine	31	17	6	25	114	2.850		

C. ESTIMATED COSTS OF REQUESTED TOOLS AND SHOP EQUIPMENT

ITEM NO.	DESCRIPTION	CALCULATED EQUIPMENT REQUIRED (APP.13)	EQUIPMENT AVAILABLE		EQUIPMENT REQUESTED	PURCHASES IN Cr$		PURCHASES IN US	
			BAD CONDITION	GOOD CONDITION		UNIT PRICE Cr$ (1.000,)	TOTAL COST Cr$ (1.000,)	CIF/RIO UNIT PRICE (US$1.00)	CIF/RI TOTAL COST (US$1.0
59	Tire Pressure Gauge	68	-	2	66	300	19.800		
60	Gasoline Filling Pump	31	11	19	12	1.260	15.120		
61	Diesel Filling Pump	31	13	15	16	1.260	20.160		
62	Portable Electric Shears for Metal Plates	6	-	1	5	500	2.500		
63	Rotary Polisher (Body Work)	31	8	7	24	350	8.400		
64	Body Tools	31	13	2	29	120	3.480		
65	Tool Kit Master Mechanic	68	-	-	68			1,200	81,60
66	Pusher and Puller Set (Small and Large)	31	-	-	31			650	20,15
67	Anvil, 40 Kg.	31	13	7	24	60	1.440		
68	Portable Spot Welding Machine	31	-	-	31	350	10.850		
69	Calendars for Plates	6	-	-	6	1.800	10.800		
70	Hydraulic Straightener for Body Work	31	-	-	31	15	465		
71	Paint Spray Gun	37	19	8	29	70	2.030		
72	Press Brake	6	1	-	6	20.000	120.000		
73	Hand Filling Pump for Transmissions	68	17	7	61	55	3.355		

C. ESTIMATED COSTS OF REQUESTED TOOLS AND SHOP EQUIPMENT

ITEM NO.	DESCRIPTION	CALCULATED EQUIPMENT REQUIRED (APP.13)	EQUIPMENT AVAILABLE		EQUIPMENT REQUESTED	PURCHASES IN Cr$		PURCHASES IN US$	
			BAD CONDITION	GOOD CONDITION		UNIT PRICE Cr$ (1.000,)	TOTAL COST Cr$ (1.000,)	CIF/RIO UNIT PRICE (US$1.00)	CIF/RIO TOTAL COST (US$1.00)
74	Grease Gun, Compressed Air	68	3	6	62	210	13.020		
75	Thicknesser	31	4	3	28	1.715	48.020		
76	Spindle Molder	31	5	3	28	900	25.200		
77	Wood Plane	31	14	11	20	1.100	22.000		
78	Circular Wood Saw	31	7	11	20	1.000	20.000		
79	Cahin and Chisel Mortiser	31	4	4	27	1.300	35.100		
80	Band Saw	31	2	-	31	2.000	62.000		
81	Tenoner	6	-	1	5	1.400	7.000		
82	Belt Sander	6	-	1	5	1.200	6.000		
83	Portable Chain Hoist Jig	37	-	-	37	380	14.060		
84	Hydraulic Track Press	6	2	1	5			7,000	35,000
85	Front End and Wheel Aligning Machine w/All Attachments	6	-	-	6			4,500	27,000
86	Impact Wrenches	37	-	-	37			300	11,100
87	Filtering Equip. for Diesel Oil (one centrifugal 1500 l/h pump and two 20,000 l tanks	31	-	1	30	3.300	99.000		
88	Steam Cleaner	6	-	-	6			1,100	6,600
	TOTAL COST						1.300.440		581,915

SUMMARY OF PROJECT COST

	Provided by DER/MG		Proposed US$ Purchases	Proposed Cr$ Purchases		TOTAL in US$ equivalent Cr$1500 = US$ 1.00
	Cr$ Costs 1.000 Cr$	Inflation Provision 1.000 Cr$	US$	Cr$ Costs 1.000 Cr$	Inflation Provision 1.000 Cr$	
Equipment Purchases being contracted	1,841,199	776,001				1,65[illegible]
Proposed Purchases of Vehicles & Machinery	10,788,000	5,241,500	5,267,500	11,651,400	4,310,292	20,247,580
Spare Parts for Above			526,750	2,243,940	1,440,690	2,332,044
Spare Parts for Existing Machinery	399,190	110,655				322,687
Existing Tools & Shop Equipment	649,999					411,392
Proposed Purchases of Tools & Shop Equipment			581,915	1,300,440	866,093	1,371,223
Contingencies			637,616			
Consulting & Engineering Cost to Date	19,717					12,479
Consulting Cost			365,000			26,355,405
Cost of Training	[illegible],352,439	3,379,542				7,425,304
SUB-TOTALS			7,37[illegible],781			33,790,000 7,37[illegible],781
TOTAL	22,050,544	9,510,49[illegible]		15,195,7[illegible]0	6,617,075	41,16[illegible],781

UNCLASSIFIED
ANNEX II,
Exhibit 7, Page 1 of 5

ANNUAL COST

A. Annual Cost of the Investment.

Real Estate (Life 100 years) Cr$ 1,374,900,000 x 0,0504 ÷ 1580	44,857
Existing Buildings (Life 25 years) Cr$ 2,329,000,000 x 0,0709 ÷ 1580	104,510
Construction of Shops & Buildings(Life 30 years) Cr$ 750,000,000 x 0,0651 ÷ 1580	30,902
Existing Vehicles & Machinery (Life 5 years) Cr$ 6,307,200,000 x 0,2310 ÷ 1580	922,128
Equipment & Machinery to be purchased(Life 8 years) Cr$ 1,841,199,000 x 0,1970 ÷ 1580	229,667
Cr$22,439,400,000 x 0,1970 ÷ 1580	2,797,824
US$(5,267,500 + 526,750) x 0.1970	1,141,467
Existing Tools & Shop Equipment (Life 5 years) Cr$ 649,999,000 x 0,2310 ÷ 1580	95,031
Tools & Shop Equipment to be purchased(Life 8 years) Cr$ 1,300,440,000 x 0,1970 ÷ 1580	162,143
US$(581,915 + 58,192) x 0.1970	126,101
Engineering Cost (distribute over 5 years) Cr$ 19,717,000 x 0.2310 ÷ 1580	2,883
US$ 365,000 x 0.2310	84,315
Cost of Training (distribute over 3 years) Cr$ 8,352,439,000 x 0.3672	1,941,149
Debt Service US$ 6,850,878 ÷ 8	856,360
Annual Cost of Investment for Maintenance after Implementation of Project	US$ 8,539,337

B. Annual Cost of Investment to Date.

Real Estate (Life 100 Years) C$ 1,374,900,000 x 0,0504 - 1580	44.857
Existing Buildings (Life 25 years) C$ 2,329,000,000 x 0,0709 - 1580	104.510
Existing Vehicles & Machinery (Life 5 years) C$ 6,307,200,000 x 0,2310 - 1580	922.128
Existing Tools & Shop Equipment (Life 5 years) C$ 649,999,000 x 0,2310 - 1580	95.031
US$	1,166.526

C. Annual Cost of Maintenance Operations.

Price Basis Jan. 1965.

Personnel	6,904,940.8	8,535,434.0
Social Benefits	2,063,886.8	2,551,241.8
Fuel & Lubricants	852,001.3	4,347,382.3
Spare Parts (5% per years)	238,000.0	2,046,849.0
Tools & Shop Supplies		430,340.0
Materials	1,260,096.8	5,525,669.0
Materials f. Regional Roads	50,000.0	50,000.0
Total	11,368,925.7	23,486,916.1
Total Converted to US$ (C$ 1820 = US$ 1.00)	6,246,662.0	12,904,898.9

ANNUAL COST INCREASE FACTORS.

Assumed annual cost increase: 55% per year

Monthly cost increases: $i = \sqrt[12]{1.55} - 1 = 0{,}0371$ or 3.71%

Price at any given months: $P_m = P_o (1+i)^n$

where P_m - price at any given month

P_o - base price

i - rate of monthly cost increase

n - number of months expired between price levels P_o and P_m

A. General Merchandise.

Annual cost C_A of known annual quantity purchased in equal monthly quantities at price levels changing monthly:

Let $(1+i) = r$

$$C_A = \frac{P_o}{12} \sum r + r^2 + r^3 + \ldots\ldots\ldots\ldots\ldots\ldots + r^{11} + r^{12} = 1.2772\ P_o,$$

Where P_o = base price at begin of year.

B. Motor Fuel & Lubricants.

Annual cost P_F of known annual quantity purchased in equal Quarterly quantities at average quarterly prices which are constant throughout each quarter:

$$C_F = \frac{P_o}{4} \left[\frac{1+r+r^2+r^3}{4} + \frac{r^3+r^4+r^5+r^6}{4} + \frac{r^6+r^7+r^8+r^9}{4} + \frac{r^9+r^{10}+r^{11}+r^{12}}{4} \right]$$

$C_F = 1.2559\ P_o$, where P_o = base price at beginning of year

C. For Wages.

Assume one wage increase of 70% starting in September of the first year. The total annual wage is $C_{W1} = \frac{8\ P_o + 4 \times 1.7\ P_o}{12} =$ $= 1.233\ P_o$, where P_o = Annual wage level at begin of year.

Assuming a 55% wage increase in September of the second year, the total annual wage for the second year is

$$C_{W2} = \frac{8 \times 1.70\ P_o + 4 \times 1.7 \times 1.55\ P_o}{12} = 2.0116\ P_o$$

where P_o = Annual Wage Level at begin of first year.

AVERAGE DIRECT MAINTENANCE EXPENDITURES IN Cr$/Km.

Expressed in Constant Cruzeiros, price base Dec.64/Jan.65

	Cr$/km.	EQUIV.US$/mile (Cr$ 1820 = US$ 1.00)
1953	315 696	279
1954	290 714	257
1955	317 450	281
1956	273 144	242
1957	503 749	445
1958	528 346	467
1959	299 806	265
1960	303 732	269
1961	355 635	314
1962	425 043	376
1963	474 084	419
1964	714 757	632
1965	951 985	1 077
1966	1 384 147	1 565
1967	1 466 008	1 658

PART III

Direct Benefits.

The project is targeted at providing the State of Minas Gerais with a maintenance organization fully capable of maintaining and gradually upgrading the state highway system. Taking the annual maintenance expenditures presented in Table 24 as a rough indication of past maintenance activity and setting the estimated annual maintenance cost for the first year of full operation in 1967 as equal to 100, it appears that the level of road maintenance will be raised from the present level of 48.8% to 100% upon implementation of the project and completion of the training program.

Immediate benefits from this increased highway maintenance will accrue to the economy of the state in the form of reduced vehicle operating costs and savings in travel time. When the state highways are upgraded to provide year-round trafficability, further reductions in transport costs will result from elimination of standing delays on transport routes that presently become impassable during heavy rains.

A comparison of the annual value of these benefits with the annual cost of the project is presented in the following paragraphs to permit evaluation of the direct return anticipated from the proposed investment for highway maintenance. The method of analysis used herein is based on data published by the American Association of State Highway Officials in the 1960 report on "Road User Benefit Analysis for Highway Improvements".

Vehicle Operating Costs.

Because of a lack of precise and sufficiently detailed information on vehicle operating costs in Brazil for use in such analysis, the evaluation of these costs has been based on the data presented in the AASHO report, adapted to presently prevailing price levels in Brazil. In order to make all costs comparable, the cruzeiro costs have been converted to US. Dollars at the rate of exchange valid at the date of the particular price quotation used. Composite vehicle prices have been established on the basis of the distribution of the various makes presented in the enclosed Tables 25 and 26. The basic values used are as follows:

Composite Passenger Car	US$ 3,320.00
Composite Truck	US$ 7,287.00
Passenger Car Tire	US$ 19.47
Composite Truck Tire	US$ 81.64
Gasoline, U.S. gal.	US$ 0.308
Oil, U.S. gal.	US$ 1.486
Passenger Car Driver	US$ 0.26/yr.
Truck Driver	US$ 832.00/yr.
Helper	US$ 416.00/yr.

The DER/MG has classified the State Highways in the following categories:

Class I - Paved Highways . Total 1325 km.

Class II - Unsurfaced Roads built to DER/MG design standards, generally with aggregate - Stabilized wearing surfaces and other highways with sufficient traffic to warrant inclusion in this group. Total 4708 km.

Class III - Unsurfaced Roads of lesser design standards and roads without definite design standards with Partially Stabilized wearing surfaces. Total 4592 km.

Class IV - Unimproved Earth Roads with traffic of less than 100 vpd. Total 5281 km.

Accordingly, these categories were used to reflect the state of the road surfaces. The operating costs for passenger cars on paved highways were developed from the AASHO data for normal operation on rural highways, for Class II roads in good condition from those for loose surface highways, and for Class IV roads in good condition from the AASHO data for unsurfaced roads. The vehicle operating costs for Class III highways were taken as intermediate between those for Class II and Class IV roads.

P. Doyen, in an article published in "Estudes Routières" in 1960, presented an analysis of the AASHO data, giving the percentage increase in running costs on roads in bad condition compared with plain surfaces as varying from 18 to 21% depending on the running speed. In the absence of other readily applicable data these values have been used to reflect the differences in operating costs due to the status of the road surfaces.

Based on our analysis of actual weighing of trucks in transit made by the DNER, the average gross vehicle weight of a composite truck, representing the average traffic composition on the state highways, was established as 11.65 metric tons. Research Report 9-A by the Highway Research Board gives the running speed for such truck as 60 km/hr, and the fuel consumption as 0.35 l/km on paved highways.

This latter value compares with actual measurements by the DER/MG, of an average consumption of 0.32 l/km for one and two-year old vehicles. In accordance with the method outlined in the AASHO report, a ratio factor was calculated for each separate cost item to obtain the operating costs for trucks on the basis of the data presented in the report.

The reduction in operating costs for vehicles travelling on well-maintained highways versus roads in poor condition calculated on this basis, and expressed in U.S. cents per km per vehicle are summarized as follows:

	TYPE OF ROAD			
	Class I	Class II	Class III	Class IV
Passenger Cars	0.9	1.2	1.7	2.3
Trucks	2.0	4.7	6.6	9.4

Traffic Volume.

Records of traffic counts made by the DER/MG and DNER on highways in the State are presented in the enclosed Table 27. These traffic counts were classified according to the class of road in order to obtain the average daily traffic volumes summarized below:

	AVERAGE DAILY TRAFFIC			
	Passenger Cars %	Buses %	Trucks %	Total VpD
Class I Paved Highway (Federal Roads excluded)	20	21	59	750
Class II Roads	16	7	77	175
Class III Roads	36	12	52	120
Class IV Roads	50	5	45	37

These traffic volumes give a fair indication of the transport activities on the various roads and have been used to represent the traffic volumes on those roads for which actual traffic counts are not presently available.

Since these traffic counts are not available to permit a reliable estimate of future traffic increases, and because the traffic growth is likely to vary from one route to another, the annual increase in overale traffic volume has been assumed as being represented by the increase in motor vehicle registration. From the data presented in Table No. 28 the average annual increase in motor vehicle registration was found to be 11.5%.

On the basis of the data presented in Table 3, the increase in traffic volume as measured by gasoline consumption was 17.0% per year, and as indicated by diesel fuel consumption 11.8% per year. Accordingly, the normal increase in traffic volume has been assumed as 11.5% per year.

Estimate of savings in Vehicle Operating Costs.

As indicated by the rainfall statistics presented in Table 29 the mean annual number of days of rain in Minas Gerais is 120 days per year. In their present condition the unsurfaced State highways become rapidly impassable during heavy rains. Further, the earth roads also become untrafficable for varying periods of time during prolonged light rains. Depending on the relative condition and firmness of the various types of road surfaces, it has been conservatively assumed for the purpose of this analysis that the state highways are impassable for the following minimum number of days:

Class I	Paved Highways	0 days/year
Class II	Roads	3 days/year
Class III	Roads	20 days/year
Class IV	Roads	30 days/year

On the basis of the considerations presented in the preceeding paragraphs, the savings in vehicle operating costs resulting from improved road maintenance during the first year of full maintenance operations after implementation of the project and completion of the training program are estimated as shown below. The period of analysis of one year has been selected because it is felt that the basic underlying traffic data do not permit a reasonable estimate of future traffic for longer periods. On the basis of the condition survey of the paved State highways presented in the enclosed Table 30, it has been assumed that savings in vehicle operating costs from improved maintenance of paved roads will accrue only to traffic using the 616 km of paved highways which are in poor condition.

Accordingly, the total annual savings in vehicle operating cost resulting from improved maintenance of the state highway system in 1967 are estimated as follows:

Class I Paved Highways:

208 cpd x 616 km x 365 days x 0.009 $/km = 411,547
832 tpd x 616 km x 365 days x 0.020 $/km = 3,754,432 4,165,979

Class II Roads:

39 cpd x 4708 km x (365-3) days x0.012$/km= 810,904
204 tpdx4708km x(365-3) days x0.047 $/km = 16,219,103 17,030,007

Class III Roads:

60 cpd x 4592km x(365-20)days x0.017 $/km= 1,634,780
107 tpd x4592km x(365-20)days x0.066 $/km =11,128,573 12,763,353

Class IV Roads:

28 cpd x5281km x(365-30)days x0.023 $/km = 1,134,369
28 tpd x5281km x(365-30)days x0.094 $/km = 4,647,447 5,781,816

TOTAL Annual Road User Savings $ 39,741,155

Return on the Investment.

The direct return on the proposed investment for improved highway maintenance in the form of reduced vehicle operating costs is compared to the annual cost of the improved maintenance according to the following ratio:

$$\text{Direct Benefit Ratio} = \frac{U_s}{C_2 - C_1 + M_2 - M_1}$$

where U_s - Annual Road User Savings resulting from the increased maintenance expenditure.

C_2 - Total Annual Cost of the investment for Maintenance after implementation of the project.

C_1 - Total Annual Cost of the investment for maintenance made prior to the implementation of the project.

M_2 - Total Annual Maintenance Operating Cost after implementation of the project and completion of the training program.

M_1 - Total Annual Maintenance Operanting Cost prior to Implementation of the project.

Using the Road user Savings computed in the proceeding paragraphs and the annual costs calculated according to Table 20, the direct benefit ratio is found to be

$$\frac{39,741,155}{8,539,337 - 1,166,526 + 12,904,899 - 6,246,662} = 2.83$$

Accordingly, the proposed increase in recurrent capital costs for maintenance facilities of $ 7,372,811 per year plus an additional expenditure for maintenance operations of $ 6,658,237 per year will result in direct benefits to road users amounting to 2.8 times the additional annual cost.

Comparison of the proposed additional investment with the annual road user savings indicates that the entire capital investment of US$ 41,342,123 will be returned to the economy of the State within a period of little more than one year (12.5 months). Further, the entire amount of the loan of $ 24,501,790 requested from USAID will be fully returned in the form of savings in vehicle operating costs within a period of 7.4 months.

Apart from decreased fuel and oil consumption, reduced tire wear, lower vehicle maintenance costs and shorter travel time, additional benefits to road users will result from upgrading of unsurfaced roads to provide year-round trafficability on the State highways. Because of the absence of sufficiently detailed traffic studies for the entire State Highway System, a direct estimate of the number of vehicles stopped on impassable roads or prevented from travelling during rainy periods cannot be made. However, the amount of gross income lost to the transport industry operating within the State can be estimated from the daily traffic volume expressed in vehicle-Kilometers and the average tonnage transported per truck.

From our analysis of actual weighing of trucks in transit carried out by the DNER, the mean gross vehicle weight was found

to be 11.65 tons and the mean net weight 4.15 tons, giving the mean tonnage transported per truck as 7.5 tons. Using the number of days during which road traffic will be interrupted by rain, and the average daily truck traffic as in the preceeding analysis, and considering the prevailing transport rate of 40 Cr$/ton/Km = 3.5 US ¢ per ton-mile, the income lost to the trucking industry because of impassable roads is conservatively estimated as follows:

Class I Paved Highways - assume no traffic interruption

Unsurfaced Roads:

Class II :	187 tpd x 4708 Km x 3 days x 0.163 $/veh.Km =	429,457
Class III:	86 tpd x 4592 Km x 20 days x 0.163 $/veh.Km =	1,284,254
Class IV :	23 tpd x 5281 Km x 30 days x 0.163 $/veh.Km =	592,497
	Total Income Lost per year	$ 2,306,208

This amount represents the loss of income to the trucking industry in 1967, if the unsurfaced state highways remain impassable during wet weather due to limited maintenance facilities.

Other Immediate Benefits.

In accordance with the equipment requirements given in the original loan application and the implementation plan presented in the preceeding chapter, the total value of equipment to be obtained from manufacturers in Brazil is estimated at US$ 16.5 million. These purchases will in turn produce income to manufacturing employees and parts and material suppliers and their employees, and will be a stimulus to the local market. Using the generally accepted value of 2.75 for the income generating capacity of

currency in Brazil as a multiplier, the resultant increase in gross national income will be roughly $ 45 million.

As a result of the proposed total investment of US$ 41.3 million, a total of 2757 new jobs will be created within the department, representing an investment of US$ 1500 for each new job created. The annual payroll for new employment created upon implementation of the project will total US$ 1,139,500. While comparatively small in relation to total income within the State, the effect of this additional employment will be significant since the new jobs will be located in outlying areas with low per capita income.

Indirect Benefits.

In addition to the road user savings and the employment created by the project, indirect benefits from upgrading of the highway system accrue to the economy of the state and the nation as a whole due to the following factors:

1. improvement of access to existing markets for local agricultural and industrial products.
2. facilitating of access to additional markets.
3. provision of improved transport routes for import of goods produced outside of the area.
4. reduction of transport costs.
5. inducement of increased inter-regional traffic and trade.

The interaction of these factors encourages increased agricultural production and will stimulate cultivation of additional

acreage. It promotes greater industrial production and induces establishment of additional enterprises in areas that are now avoided because of limited and questionable accessibility. It will further encourage exploitation of the mineral resources of the state and will bring into production mines which cannot now profitably transport ores for sale on distant markets. Increased agricultural, industrial and mining activity will lead to greater effective employment and higher individual incomes, and consequently greater buying power.

Unfortunately it is impossible to arrive at reliable estimates of these indirect benefits accruing to the communities served by the State Highway System, and to the adjacent areas because of the character and the interaction of the factors involved, because of a general absence of specific values of accepted accuracy for use in an analysis, and due to the lack of relevant statistics on economic growth following upgrading of highways or a highway system in comparable areas. Therefore, only rough indications of these effects can be given.

The relative importance of the various physiographic regions of the state is indicated in the maps submitted together with this report, and in Appendix 6 of the original loan application. Comparison of traffic volume and direct road user benefits for the different types of state highways shows the following relationship:

	Estimated Average Daily Traffic in 1967 Vehicles per Day	Road User Benefits US$ per Km per year.
Class I Paved Highways	1040	6770
Class II Roads (partially stabilized wearing surface)	243	3610
Class III Unsurfaced Roads	167	2780
Class IV Earth Roads	56	1095

Accordingly, the direct benefits will be greatest in the southern and southeastern area of the State which have already reached a certain stage of economic development and are served by a comparatively dense highway network of higher class roads. With improved highway facilities in these areas new wealth will be brought into circulation because products can then be sold to consumers more cheaply and demand for them increases; there will also be a tendency to speacialize activities according to the suitability of the surroundings, as reflected in greater decentralization of industrial and commercial activities. Since, the project is concerned with upgrading the trafficability of existing road transport routes which in the more developed areas of the state already carry substantial traffic, the indirect benefits derived from implementation of the project in these areas will be proportional to the direct benefits.

The less developed and depressed areas in the northern part of the state are served by fewer roads. The Class III and Class IV earth roads predominant in these areas constitute the major access routes and their condition is of vital importance to the local economy. While the direct road user benefits derived from implementation of the project in these regions will be roughly

one sixth of those in the more developed areas, the mere fact of ensuring constant traffic along arterial routes which are presently cut off in bad weather will have a disproportionally large effect on the economy. Upgrading of the major transport routes and provision of year-round trafficability in these regions will lead to increased sales of local products to other zones in return for other products, creating new needs through intensified contacts between neighbouring populations. The latent resources of the northern and northwestern portions of the State can then be more effectively mobilized.

An indication of the incentive for additonal production and increased trade resulting from the implementation of the project may be obtained from estimates of the present and potential transport volume. Using the truck traffic volumes and the mean tonnage transported per truck as in the preceeding analysis, and considering a normal increase in vehicular traffic of 11.5% per year independent of the effects of the project, the annual transport volume handled on the State Highway System in 1967 is estimated as follows:

Class I Paved Highways:

	613 tpd x 1325 Km x 365 days	=	296,462,125
Unsurfaced Roads:			
Class II:	187 tpd x 4708 Km x 362 days	=	318,703,352
Class III:	86 tpd x 4592 Km x 345 days	=	136,244,640
Class IV:	23 tpd x 5281 Km x 335 days	=	40,690,105
Total veh.-Km/year:			792,100,222

Total annual transport volume in 1967:

792,100,222 veh.-Km x 7.5 t./veh. = 5,940.7 million ton-Km/year.

Disregarding the additional traffic that will be generated due to improved road conditions, this annual traffic volume can be increased by at least 106.4 million ton-Km per year or roughly 2% due to provision of year-round trafficability. Due to the higher driving speeds possible on well maintained road surfaces, the travel times on the State highways will be reduced by an estimated average of 43.3%. If this potential were fully realized, the annual volume of road transport could be increased by 2,572.3 million ton-Kilometers per year without substantial increase of the trucking fleet, representing a potential income to the trucking industry of US$ 53 million.

The highway transport rates presently quoted in Minas Gerais for transport on unsurfaced roads are 20% higher than the rates for transport on paved highways. A reduction of only 5% (2 Cr$ per ton-Km) in the transport charges for unsurfaced highways would result in annual savings of:

3,717.3 ton-Km/year x Cr$ 2.0 ÷ 1820 = US$ 4,023,655 per year

This possible reduction in road transport cost represents 55% of the annual cost of the proposed investment for improved highway maintenance facilities.

On the basis of the above considerations, the entire State Highway System has been included in establishing the project requirements. Since the entire amount of the proposed capital investment will be returned to the economy of the State in the form of direct road user savings within a period of little more than one year, and because the indirect benefits will be disproportionally greater in the less developed northern regions,

the economic impact of the project should make itself felt throughout the entire State almost immediately after full highway maintenance capabilities have been established. The upgrading of road transport facilities through the proposed increase of maintenance operations is an important part of the development policy of the State. It is integrated with other measures of the State Government aimed at stimulating economic growth, such as the financing of small and medium size enterprises by the Development Bank of Minas Gerais (Banco do Desenvolvimento de Minas Gerais), the rural storage program of the Warehouse and Silo Company (CASEMG) and the continuing investment in rural electrification by the Electric Company of Minas Gerais (CEMIG).

AID-DLC/P-311
ANNEX III
May 3, 1965

FINANCIAL DATA

Table of Contents

Exhibit 1	Estimated Receipts 1965 - 1975
Exhibit 2	Financial Statements 1959 - 1964
Exhibit 3	Financial Statements 1965 - 1967
Exhibit 4	Mission Local Currency Availabilities

M I N A S G E R A I S S T A T E H I G H W A Y D E P A R T M E N T

ESTIMATED RECEIPTS 1965 THROUGH 1975.

In Million Cruzeiros (Cr$ 1,000,000)

Y E A R	T O T A L NATIONAL HIGHWAY FUND	DER-QUOTA of NATIONAL HIGHWAY FUND	DER-QUOTA NATIONAL PAVING FUND	S T A T E BUDGET ALLOCATION	ESTIMATED TOTAL in constant Cruzeiros Dec.64 prices	DER/MG RECEIPTS corrected for inflationary changes
1959		876	140	1.692		2.708
1960		950	276	1.389		2.615
1961		2.128	300	1.451		3.879
1962		3.015		3.069		6.084
1963		5.395		3.800		9.195
1964		10.183		22.144		32.327
1965	560.005	25.072		25.072	50.144	68.959
1966	595.264	26.650		26.650	53.300	113.632
1967	633.095	28.344		28.344	56.688	187.256
1968	673.584	30.156		30.156	60.312	308.799
1969	717.066	32.103		32.103	64.206	886.656
1970	779.532	34.900		34.900	69.800	1,493.950
1971	832.930	37.291		37.291	74.582	1,422.267
1972	889.985	44.770		44.770	89.540	2,646.681
1973	950.950	47.837		47.837	95.674	4,383.414
1974	1,016.090	51.113		51.113	102.226	7,259.727
1975	1,085.692	54.615		54.615	109.230	12,023.354

Note: Total DER/MG receipts for 1959 through 1963 are actual receipts as shown in the accounting records of the Department, for 1964 from the total budgets approved by the State Highway Council.

Table 5

MINAS GERAIS STATE HIGHWAY DEPARTMENT

- FINANCIAL STATEMENTS -

In Thousand Cruzeiros (Cr$ 1,000)

	1959	1960	1961	1962	1963	1964
RECEIPTS						
National Highway Fund	876,167	950,000	2,128,398	3,014,794	5,395,087	10,183,000
National Paving Fund	140,000	276,530	300,000			
State Allocation	1,692,257	1,388,767	1,451,552	3,069,000	3,800,000	22,144,131
Road Tolls	11,402	19,067	5,795			
Bank Interest	10,222	9,164	7,005	12,614	6,729	1,700
Rental	1,130	1,858	1,076	2,123	3,223	6,000
Miscellaneous Interest					55	200
Concessions	16,503	23,532	31,985	90,341	132,281	140,000
Fines	4,136	8,874	3,608	5,260	20,767	14,000
Funds not expended as allocated	4,662	5,113	10,413	455,713	205,842	7,000
Sales of Unserviceable Items			33			3,000
Miscellaneous Receipts	16,111	8,555	21,023	1,498	14,009	5,000
Administration of Delegated Works				44,595	98,465	83,000
SUB-TOTAL - Ordinary Receipts	2,772,640	2,691,460	3,960,888	6,695,938	9,676,458	32,587,031
Sales of Real Estate						
Sales of Other Assets						
SUB-TOTAL - Capital Receipts	3,440		2,916	20,078	13,515	10,000
Delegated Construction Fund						5,622,000
Services to Third Parties	86,516	28,317	40,123			80,000
SUB-TOTAL - Accounts Receivable	86,516	28,317	40,123	2,289,880	3,300,560	5,702,000
Miscellaneous Fees						
Proceeds of Credit Operations				871,484	1,340,838	
SUB-TOTAL - Extraordinary Receipts				871,484	1,340,838	
TOTAL Budgetary Receipts	2,776,770	2,691,460	3,963,804	9,877,380	14,331,371	
Various Credits	584,384	336,869	1,006,091			
SUB-TOTAL - Extrabudgetary Receipts	584,384	336,869	1,006,091	3,092,926	3,216,217	
Cash Balance	4,442	1,223	3,118	32,356	8,126	
Bank Balance	32,930	320,639	118,727	295,539	512,913	
Outstanding Accounts	4,506	5,959	82,685	23,771	36,779	
SUB-TOTAL - Carry over from pastyear	41,878	327,822	204,530	351,666	557,818	
TOTAL RECEIPTS	3,408,858	3,384,468	5,214,548	13,321,972	18,105,406	38,299,031

MINAS GERAIS STATE HIGHWAY DEPARTMENT

- FINANCIAL STATEMENTS -

In Thousand Cruzeiros (Cr$ 1,000)

DISBURSEMENTS	1959	1960	1961	1962	1963	1964
Permanent	187,484	264,482	372,261	514,902	965,841	5,310,373
Social Security	61,675	71,404	141,244	183,875	548,622	1,161,200
Office Supplies, etc.	177,[illegible]53	262,775	303,508	354,710	596,953	100,400
Transport, utilities, etc.	26,994	58,520	106,820	77,752	255,107	2,278,531
Exhibits, Public Relations, Highway & Traffic Council	2,332	2,201	4,145	143,521	37,647	136,000
Sub-Total - Administrative Expenditures	455,638	619,479	927,978	1,274,760	2,404,170	8,986,504
Sub-Total - Public Transport						122,000
Maintenance of Main - Roads	363,511	461,485	770,135	1,549,274	3,271,935	3,921,570
Maintenance of Regional Roads	21,042	25,589	38,961	5,449	20,097	50,000
Betterments	4,195	6,110	9,087	10,470		410,000
Fuel & Lubricants						850.000
Spare Parts & Misc. Costs	5,997	10,000				238,510
SUB-TOTAL - Maintenance Expenditures	394,745	503,184	818,183	1,565,193	3,292,032	5,469,510
TOTAL - Current Expenditures	850,383	1,122,663	1,746,161	2,839,953	5,696,202	[illegible]
Headquarters & Central Shop						60,000
Residences & Crew Quarters						120,000
Belo Horizonte Bus Station						
SUB-TOTAL - Real Property Investments & Improvements	10,719	17,662	64,363	39,357	76,140	180,000
Office Equipment & Furniture						40,000
Purchase of Vehicles & Equipment					72,600	2,950,000
Purchase of Shop Equipment					114,147	101,000
SUB-TOTAL - Other Assets	87,627	35,335	198,947	586,542	186,747	3,091,000
TOTAL - Capital Investments	98,346	52,997	263,310	625,899	262,887	3,271,000

MINAS GERAIS STATE HIGHWAY DEPARTMENT

- FINANCIAL STATEMENTS -

ANNEX III
Exhibit 2, Page 3 of 3

In Thousand Cruzeiros (Cr$ 1,000)

DISBURSEMENTS	1959	1960	1961	1962	1963	1964
Planning & Design	13,221	15,060	22,899	30,986	60,858	90,900
Research & Investigations	2,500	5,000	7,500	-	-	42,000
Highway Construction	1,308,845	1,431,428	1,715,053	2,774,608	4,228,594	10,611,000
Expropriations	7,406	11,997	6,309	16,719	18,468	50,000
SUB-TOTAL - Construction Expenditures	1,331,972	1,463,485	1,751,761	2,822,313	4,307,920	10,793,900
Delegated Construction						8,111,000
Services to Third Parties						80,000
SUB-TOTAL - Reimbursable Expenses				2,289,880	3,300,560	8,191,000
Retirement of Promissary Notes						429,625
Amortization of Equipment Financing						228,100
Repayment of Loans						200,000
Other Highway Obligations						2,500
SUB-TOTAL - Retirement of Debts						860,225
Bank Charges				30,147	3,554	
Interest on Loans & Debts				86,012	25,070	604,832
SUB-TOTAL - Interests				116,159	28,624	604,832
TOTAL BUDGETARY EXPENDITURES	2,280,701	2,639,145	3,779,232	8,694,204	13,596,193	38,299,031
TOTAL - Extrabudgetary Expenditures	800,335	540,793	1,101,650	4,069,950	3,830,626	
Cash on Hand	1,224	3,118	32,356	8,126	42,026	
Bank Balance	320,639	118,727	295,539	512,913	585,691	
Advances	5,959	82,685	23,771	36,779	50,870	
SUB-TOTAL - Balances at end of Year	327,822	204,530	327,895	557,818	678,587	
TOTAL	3,408,858	3,384,468	5,214,548	13,321,972	18,105,406	38,299,031

Table 9 (cont)

MINAS GERAIS STATE HIGHWAY DEPARTMENT

PROVISIONAL BUDGETS 1965 - 1967

In Thousand Cruzeiros (Cr$1,000)

AID-DLC/P-311
ANNEX III
Exhibit 3, Page 1 of 3

RECEIPTS	1965	1966	1967
National Highway Fund	34 479 360.0	56 816 000.0	93 628 000.0
State Budget Allocation	34 479 360.0	56 816 000.0	93 628 000.0
SUB-TOTAL	68 958 720.0	113 632 000.0	187 256 000.0
Rentals	3 500.0	11 409.7	18 [illegible]
Bank Interests	15 000.0	50 202.7	82 427.4
Concessions & Services	270 000.0	880 831.6	1 446 097.5
Fines	15 000.0	50 202.7	82 427.4
Reimbursement f. Delegated Construction	6 600 000.0	-	-
Miscellaneous Receipts	25 300.0	82 149.8	134 661.2
Sales of Fixed Assets	20 000.0	66 176.3	106 701.0
Sales of Unserviceable Items	650 000.0	23 755.2	46 026.0
SUB-TOTAL Miscellaneous Receipts	7 598 800.0	1 164 728.0	1 919 274.0
TOTAL Ordinary Receipts	76 557 520.0	114 796 728.0	189 175 274.0
USAID Engineering Grant	45 000.0		
USAID Equipment Loan	27 054 355.0		
TOTAL Extraordinary Receipts	27 099 355.0	—	—
Cash on Hand	19 942.3		
Commercial Banks	737 651.7		
Banco do Brasil - USAID Grant	105 000.0		
Treasury Bonds	2 386 700.0		
TOTAL Balance forward from past year	3 249 294.1	644 025.6	472 [illegible]
TOTAL RECEIPTS	106 906 169.1	115 440 753.6	189 647 479.[illegible]

MINAS GERAIS STATE HIGHWAY DEPARTMENT

PROVISIONAL BUDGETS 1965 & 1967

In Thousand Cruzeiros (Cr$ 1,000)

ANNEX III
Exhibit 3, Page 2 of 3

DISBURSEMENTS	1965	1966	1967
1. Administration.			
Personnel, incl. Social Benefits	6 085 476.3	10 532 497.4	16 940 938.1
Supplies	200 520.4	348 092.9	558 817.6
Fuel & Lubricants	56 830.6	75 554.2	121 691.[illegible]
Services & Misc. Admin. Costs	632 852.6	1 070 127.5	1 642 023.[illegible]
TOTAL Administrative Expenditure	6 975 679.[illegible]	11 976 372.0	19 263 [illegible]
2. Highway Maintenance.			
Exist. Personnel, incl. Social Benefits	10 131 956.2	16 543 379.1	26 154 564.6
Add. Personnel under Civil Service Plan	703 874.1	1 149 280.2	1 816 932.[illegible]
Additional Personnel for Project	1 465 975.5	4 172 004.5	6 595 649.6
SUB-TOTAL Maintenance Personnel	12 301 805.8	21 864 663.8	34 567 146.[illegible]
Maintenance Materials - past level	2 896 950.0	4 490 272.5	6 959 969.1
Add. Maint. Materials for Project	2 011 969.7	8 785 147.2	13 617 069.7
Maintenance of Regional Roads	63 860.0	77 500.0	120 125.0
Fuel & Lubricants for existing equipment	1 055 215.3	1 635 583.8	2 535 875.4
Additional Fuel & Lubricants for Project	1 529 154.0	6 704 331.7	10 495 194.[illegible]
Spare Parts & Expendable Items	587 512.0	2 906 675.4	7 601 [illegible].7
SUB-TOTAL Maintenance Materials & Supplies	8 144 661.0	24 599 510.6	41 [illegible]
Betterments	6 143 644.4	2 649 953.3	14 2[illegible]
TOTAL Maintenance Expenditure	26 590 111.2	49 114 127.7	90 2[illegible]
3. Investments in Fixed Assets.			
Building Construction - H.Q. & Central Shop	383 160.0	296 940.0	[illegible]
Building Construction - Residencies	574 740.0	989 800.0	1 227 [illegible]
Construction - Belo Horizonte Bus Terminal	1 500 000.0	5 938 800.0	4 602 600.0
Purchases of Real Estate	25 544.0	47 510.4	76 710.[illegible]
SUB-TOTAL Real Estate & Buildings	2 483 444.0	7 273 050.4	6 [illegible]
Office equipment & furniture	85 000.0	118 776.0	[illegible]
Highway Maintenance Equipment	-	-	[illegible]
Vehicles & Trucks	-	-	1 [illegible]
Maintenance Equipment for Project	33 590 753.0	2 065 069.0	-
Shop Equipment & Motors	-	-	[illegible]
Shop Tools	-	-	[illegible]
Shop Equipment & Tools for Project	-	2 166 533.0	-
Miscellaneous Permanent Items	228 618.8	432 305.0	87[illegible] 297.3
SUB-TOTAL Other Fixed Assets	33 827 871.8	4 802 683.0	4 141 143.[illegible]
TOTAL Capital Investments	36 311 315.8	12 075 733.4	10 600 1[illegible]

MINAS GERAIS STATE HIGHWAY DEPARTMENT

PROVISIONAL BUDGETS 1965 - 1967
In Thousand Cruzeiros (Cr$ 1,000)

ANNEX III
Exhibit 3, Page 3 of 3

DISBURSEMENTS	1965	1966	1967
4. Highway Construction.			
Consulting Services	150 000.0		
Highway Planning & Design	104 091.8	403 885.2	672 644.7
Research & Testing	17 880.0	141 359.8	235 425.6
SUB-TOTAL - Highway Engineering	271 972.6	544 945.0	908 070.3
Highway Construction	12 403 394.6	16 380 791.6	12 765 725.1
Paving	22 217 845.0	24 007 727.4	54 498 747.3
SUB-TOTAL - Direct Construction Cost	34 621 239.6	40 388 519.0	67 264 472.4
Expropriations	102 176.6	242 331.1	403 586.8
TOTAL Highway Construction	34 995 388.8	41 175 795.1	68 576 129.5
5. Repayment of Debts.			
USAID Loan			
Highway Bonds			
USIMINAS Construction Loan	179 375.0	-	-
Government Banks	953 651.7	-	-
TOTAL Repayment of Debts	1 133 026.7	—	—
6. Interest on Loans.			
USAID Loan	85 011.0	539 113.0	682 465.0
Highway Bonds	89 832.0	87 707.0	73 [illegible]4.0
USIMINAS Construction Loan	24 559.0	-	-
Government Banks	57 219.1	-	-
TOTAL Interest	256 621.1	626 820.0	767 169.0
TOTAL EXPENDITURE	106 262 143.5	114 968 848.2	189 437 167.1
Balance at End of Year	644 025.6	471 905.4	210 112.3
TOTALS	106 906 169.1	115 440 753.6	189 647 279.4

1965 PL 480 Loans (billions of cruzeiros)

SECTORS AND PROJECTS	REQUIREMENTS	ALLOCATION	COMMENTS
Development Banks			
State & Regional BNDE	5-10	5.0	
Private Enterprise - BNDE	33	33.0	
Bank of the NE (BND)	3	3.0	Alternative sources: BNDE, CNCR, FUNDECE.
Industry			
COPERBO	4.4	4.4	Initial 2.0 with 2.4 contingent on financial plan
COSIPA	15-20	15.0	
Belgo-Mineira	10		
Aços Anhanguera	7		BNDE
Transportation			
Rio Grande do Sul Road	10	10.0	
Rio-São Paulo Highway	10	10.0	
Goiás Feeder Roads	5-10	2.0	
Paraná Road	5-10	10.0	
Minas Gerais Road MG-4	10		
Santos Docks	4.0		Will be considered if availabilities increase.
Minas Gerais Highway Mtn Eq.	12	9.0	
Pará Highway Maintenance Eq.	1.0	1.0	
Recife Dry Docks	0.3	0.3	
Bahia Road	7.0	3.5	
Maranhão Road	3.0		
Rio Grande do Norte	2.6		
Power			
Furnas	4.5	4.5	
Peixoto	6		Eletrobrás program loan or possible dollar loan.
Caxias do Sul	2.9		Eletrobrás program loan.
CELG	3.9	3.9	
CERNE	2.5		Included in grant program.
Power Program Loan (1/c)	25.0	25.0	Possible reduction to 19.0 if Peixoto is dollar financed.

SECTORS AND PROJECTS	REQUIREMENTS	ALLOCATIONS	COMMENTS
Water & Sewage			
Water Fund	8.0	6.0	Balance through grant program, if possible.
Agriculture			
Fertilizer Manufg.	10.0		Possible dollar loan.
Mogiana Corp.			Dollar Loan.
Bank of Amazonas			CNCR
Housing			
Labor Housing	5-10	5.0	
Pernambuco S&L	2.8		National Housing Bank.
Self-help Housing Maranhão	0.3		National Housing Bank.
Rio Hilton	2.0		Will be considered if availabilities increase.

TOTAL Allocations	150.6
TOTAL Availabilities	146.2
Deficit	4.4

DRAFT LOAN AUTHORIZATION
Provided from: Alliance for Progress Funds
Brazil - Minas Gerais Highway Department

Pursuant to the authority vested in the Administrator of the Agency for International Development ("A.I.D.") by the Foreign Assistance Act of 1961, as amended, and the delegation of authority issued thereunder, I hereby authorize the establishment of a loan pursuant to Part I, Chapter 2, Title VI, Alliance for Progress, of said Act to The State Highway Department of Minas Gerais, Brazil ("Borrower") of not to exceed fifteen million United States dollars ($15,000,000)to finance the dollar and local costs of equipment, material, and services required to augment the State's inventory of highway maintenance equipment and spare parts, including the cost of consulting engineering. This loan to be subject to the following terms and conditions:

1. Interest and Terms of Repayment:

a. Borrower shall repay the loan by paying to the Government of Brazil ("Government") within twenty (20) years from the first disbursement, including a grace period of not to exceed three (3) years ("Borrower grace period") the equivalent of the United States dollar amounts disbursed. Borrower shall pay interest to the Government on the disbursed balance of the loan at the rate of three and one-half (3-1/2) percent per annum, except that interest accruing during the Borrower grace period may be capitalized as it accrues. All payments by Borrower to the Government shall be payable in the currency of Brazil, at a rate of exchange determined as of a time and in a manner satisfactory to A.I.D.

b. The Government shall pay to A.I.D.:

(i) the equivalent in United States dollars, determined as of a time and in a manner calculated to obtain repayment of all dollars disbursed plus dollar interest, of all amounts paid to Government as follows:

(a) all interest immediately upon receipt subject to Government's right to retain all payments in excess of one (1) percent per annum during a grace period of not to exceed ten (10) years from the first disbursement under the loan ("Government grace period") and all payments in excess of two and one-half (2-1/2) percent per annum thereafter.

(b) principal within forty (40) years, including the Government grace period.

(ii) interest in United States dollars of one (1) percent per annum during the Government grace period, and two and one-half (2-1/2) percent per annum thereafter on all amounts of outstanding principal paid by Borrower to Government from the respective dates of such payments of principal.

(iii) interest in United States dollars of one (1) percent per annum on the disbursed balance of the loan during the Borrower grace period, except to the extent that interest in such amount is payable to A.I.D. pursuant to paragraphs 1(b) (i) and 1(b) (ii) above.

2. Other Terms and Conditions

a. Equipment, materials, and services financed under the loan shall be procured from the United States of America.

b. The loan shall be secured or guaranteed in a manner acceptable to A.I.D.

c. Prior to disbursement, Borrower shall provide evidence satisfactory to A.I.D. that Brazilian currency funds needed for the project will be available.

d. The loan shall be subject to such other terms and conditions as A.I.D. may deem advisable.

_____
Administrator

_____
Date